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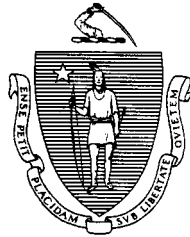
**A TMDL Alternative Regulatory Pathway Proposal for the
Management of Selected Mercury-Impaired Waters**

***A Supplementary Document to the*
Massachusetts Year 2004 Integrated List of Waters**

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FOREWORD

The Federal Water Pollution Control Act of 1972 (FWPCA) and subsequent Amendments in 1977, 1981 and 1987 are collectively known as the Clean Water Act (CWA). Section 303(d) of the CWA and the implementing regulations at 40 CFR 130.7 require states to identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and to prioritize and schedule them for the development of a total maximum daily load (TMDL). A TMDL establishes the maximum amount of a pollutant that may be introduced into a waterbody and still ensure attainment and maintenance of water quality standards. Furthermore, a TMDL must also allocate that acceptable pollutant load among all potential sources.

On April 1, 2004 the Massachusetts Department of Environmental Protection (MADEP) submitted the *Massachusetts Year 2004 Integrated List of Waters – Proposed listing of the condition of Massachusetts’ waters pursuant to Sections 303(d) and 305(b) of the Clean Water Act* (the “proposed 2004 Integrated List”) to the Environmental Protection Agency (EPA) for review and comment. This document was prepared in accordance with *Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act* (Listing Guidance). The integrated listing format presents the status of all previously assessed waters in a single multi-part list and each water body or segment thereof is included in one of the following five categories:

- 1) Unimpaired and not threatened for all designated uses;
- 2) Unimpaired for some uses and not assessed for others;
- 3) Insufficient information to make assessments for any uses;
- 4) Impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and
- 5) Impaired or threatened for one or more uses and requiring a TMDL.

Thus, waters listed in Category 5 constitute the 303(d) List and, as such, are to be reviewed and approved by the EPA.

Concurrent with the ongoing review of the proposed 2004 Integrated List, the MADEP is submitting, through the EPA Region 1 TMDL Innovations Project, an alternative management strategy for selected waters or segments of waters that are impaired by mercury originating from atmospheric deposition. This document, prepared as a supplement to the proposed 2004 Integrated List, provides the rationale behind the proposal to manage these mercury-impaired waters, in lieu of the derivation of formal TMDLs, through a number of existing mercury reduction implementation measures.

While the proposal contained in this report is based on EPA guidance for listing waters in Category 4 (“impaired, but not requiring a TMDL”), it is important to note that not all waters covered by this management strategy will automatically be removed from Category 5 to a different category. This is because other pollutants that still require the development of TMDLs also impair some waters impaired by mercury, and these waters must remain in Category 5. For this reason it is advantageous to consider the implementation of this proposal in terms of “segment-stressor combinations” rather than waterbodies. The rationale presented in this document for moving mercury-impaired segments from Category 5 to Category 4 applies to all lakes and ponds impaired by mercury from atmospheric sources irrespective of whether the segment can actually be removed from Category 5 (i.e., the 303(d) List). Nonetheless, those “segment-stressor combinations” covered by this proposed strategy will be labeled as such in the Final Integrated List of Waters in a manner similar to that used to identify segments covered by approved TMDLs. In addition, a list of those lakes and ponds is presented in this document.

Applicability

Because of the unique attributes of mercury sources and impacts, this proposal is intended to be applicable only to water bodies impaired by air deposition of mercury. The proposed alternatives would be an option for states that have adopted and implemented mercury reduction strategies. In all cases the water bodies in question would continue to be listed as “impaired” until water quality criteria are met, but TMDLs would not be required as long as the state continues to demonstrate effective, ongoing implementation of mercury reduction strategies addressing in-state mercury sources.

PURPOSE OF THE MERCURY TMDL ALTERNATIVE REGULATORY PATHWAY PROPOSAL

All of the New England states, including Massachusetts, currently have statewide fish consumption advisories in effect due to high levels of mercury in fish tissue. Most of the states also include on their 303(d) Lists individual lakes and ponds where the fish collected from these water bodies exceed state safe consumption levels for mercury. In many cases the atmospheric deposition of mercury is the only known pollutant source impairing these water bodies. Out-of-state and out-of-region sources are major contributors to this atmospheric deposition. Consequently, Massachusetts is proposing to address lakes and ponds impaired by atmospheric mercury deposition under an alternative regulatory pathway rather than through the use of the TMDL process. Because of the unique attributes of mercury source inputs and impacts, this alternative regulatory proposal is intentionally restricted only to mercury impaired waterbodies impacted by air deposition sources and would not be appropriate to other impairments. Under the proposed alternative, waterbodies would continue to be listed as impaired but specific TMDLs would not be required provided a state can demonstrate that it has adopted and is effectively implementing mercury reduction strategies addressing in-state mercury releases to the environment.

While more than one alternative regulatory option is consistent with the EPA's requirements for preparing integrated lists of waters, Massachusetts is seeking the EPA's approval to list mercury air deposition impacted waters pursuant to the following options:

- 1) Category 4B (impaired waters that do not need a TMDL), as allowed under EPA's Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act (the “Listing Guidance”).
- 2) Establish a new Category (i.e., 4D) based on the same rationale, as allowed under the Listing Guidance.
- 3) Obtain approval as an innovative pilot project in accordance with EPA guidance for listing waters in Category 4 specifically designed for mercury impaired waters due to atmospheric deposition which will serve to benchmark and establish performance standards for qualifying future proposals for a newly created pathway in the upcoming revision to the 2006 EPA Listing Guidance.

As discussed in more detail below, Massachusetts can demonstrate that it is effectively implementing a comprehensive plan to address in-state mercury sources and that a combination of federal, regional and state controls on mercury are the most effective means of remediating the mercury impairment to air impacted water bodies. Therefore, the establishment of waterbody specific TMDLs would not identify additional actions that MA could take to address the impairments beyond actions already committed to. Thus, the traditional TMDL approach is not warranted.

MERCURY CONTAMINATION IN MASSACHUSETTS AND NEW ENGLAND

Many lakes and ponds in Massachusetts and New England have fish contaminated with mercury. Mercury is persistent in the environment and does not decay or break down into less harmful compounds. Mercury is naturally occurring, can be found in many waste stream products (such as thermometers and electrical switches), and is emitted from combustion facilities. Mercury is also bioaccumulative, which is the reason it is found in predator fish tissue. The primary public health concern with mercury is consumption of fish with elevated levels, particularly consumption by pregnant woman and children. For these reasons, controlling, reducing and eliminating mercury contamination is critically important to the public health and the environment.

Lakes and ponds are more frequently sampled fresh water bodies for the presence of mercury contamination, so some caution is needed in extrapolating to rivers and streams. Even so, it is reasonable to assume control measures based on mercury levels found in lakes and ponds will benefit rivers and streams and other water resources. Mercury contamination most often is detected through monitoring mercury in those portions of fish tissue normally consumed by humans. Mercury, which in fish generally is in the methylated form (at least 90% is methyl mercury), presents a serious health threat not only to humans but also to wildlife that feed on fish.¹ An incident of severe mercury poisoning through consumption of contaminated fish occurred in Japan² and the effects of lower doses have been detected in several epidemiological studies.³ Thus, the hazard presented by mercury is well documented.

As previously noted, all of the New England states have a statewide advisory for eating fish contaminated with mercury. Massachusetts and other New England states also have 303(d)-listed a number of specific lakes where data have been collected confirming high levels. Across the New England states, approximately 200 water bodies have been specifically listed for fish consumption impairments. In Massachusetts, this hazard has affected over 100 water bodies for which specific advisories for the general population to limit or avoid fish consumption have been issued by the Massachusetts Department of Public Health ("DPH"). In addition, DPH, similar to public health agencies in other states, has issued a statewide advisory to limit the consumption of fresh-water fish.⁴ The in excess of 100 lake/pond-specific advisories for the general public in Massachusetts represent over 50% of the approximately 200 lakes and ponds that have been sampled for mercury in fish tissue. Over 60% of the waterbodies tested have one of more species with mercury levels high enough to necessitate consumption advisories for sensitive subgroups. Few of these water bodies are impacted by direct point sources of mercury. In most cases, the only apparent source of mercury appears to be from both near-field and far-field atmospheric deposition, which accounts for the widespread contamination of fish in lakes and ponds throughout the northeastern United States and eastern Canada. The specific percent reduction needed to achieve the fish consumption use is extremely difficult to define because the process by which mercury moves from the atmosphere through the food chain (water, sediment, and bioaccumulation in fish) is not well defined nor easily modeled. Mercury is not only a nonpoint source pollutant that is atmospherically driven, it exhibits complex biogeochemical dynamics and bioaccumulative properties, as well. Nonetheless, an estimate of 75% or greater reduction has been derived (see section on mercury loading reductions later in this report.)

¹ See, e.g., National Forum on Mercury in Fish: Proceedings. EPA 823-R-95-002, June 1995.

² Water Quality Criterion for the Protection of Public Health: Methyl Mercury EPA-823-R-01-001 January 2001, Section 3.2.1.1

³ Water Quality Criterion for the Protection of Public Health: Methyl Mercury EPA-823-R-01-001 January 2001, Section 3.2.1.7

⁴ DPH press release notes that as of July 2001, 111 waterbodies have specific advisories. (<http://www.state.ma.us/dph/media/2001/pr0724.htm>) At least a few of these advisories are related to point sources of Hg and so those advisories resulting from non-point sources of Hg are slightly fewer than the total.

Several studies have evaluated mercury sources in New England, two of which are highlighted below. In 1996, Massachusetts assessed mercury emissions and impacts. **Mercury in Massachusetts: An Evaluation of Sources, Emissions, Impacts and Control**, C. Mark Smith and Carol Rowan-West, eds, Office of Research and Standards, Massachusetts Department of Environmental Protection (1996) (<http://www.state.ma.us/dep/files/mercury/hgtoc.htm>) estimated that close to 60% of the mercury deposition in MA was likely to have been attributable to out-of-state sources. In 1998, the Regional Northeast States and Eastern Canadian Provinces Mercury Study assessed the same issues as well as mercury deposition. This later regional report estimated, based on mid-1990's emission inventory data and a more sophisticated model, that out-of-region sources deposited an estimated 4,228 kg/yr of mercury (both wet and dry deposition) or 53% to the northeast of which about 1,809 kg/yr or 23% comes from the global reservoir during the mid to late 1990s. During this period sources within the northeast region deposited an estimated 3,787 kg/yr or 47% of mercury to the region. A summary of those estimated contributions is provided in Table 1.

Table 1
Contribution of Northeast Sources, out-of Region U.S. Sources, and the Global Reservoir to Modeled Deposition in the Northeast (kg/yr) ⁵

Sources Inside Region	3,787	47%
U.S. Sources Outside Region	2,419	30%
Global Reservoir	1,809	23%
Total Deposition	8,015	100%

The 1998 regional study also found that regional combustion source emissions represented 87% of the total inventory with the three largest mercury source categories being municipal waste combustors, non-utility boilers, and electric utility boilers. Manufacturing sources and "area" sources contributed approximately 7% and 6%, respectively, of the total inventory at that time.

The three largest mercury source categories for out-of-region sources included electric utility boilers (31%), municipal waste combustion and sewage sludge incinerators (22%), and non-utility fossil fuel boilers⁶ (17%).

Because of the substantial reductions in mercury emissions that have been achieved in the region since that time, a greater fraction of mercury deposition is now likely to be attributable to out-of-region sources. At present, the NEG-ECP Mercury Task Force and NESCAUM, with EPA and MADEP funding, are updating mercury emission inventories and deposition modeling to better address this issue. Results are expected early next year.

THE LISTING GUIDANCE FRAMEWORK

The proposed 2004 Integrated List was prepared in accordance with the EPA's *Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act* (July, 21, 2003). Massachusetts' proposed implementation plan for waters impaired by the atmospheric deposition of mercury is consistent with the Listing Guidance for placing water bodies or segments thereof in Category 4B of the Integrated List. In describing which waters belong in Category 4B, the Listing Guidance (p. 5) makes clear that current EPA

⁵ Source: Northeast States and Eastern Canadian Provinces Mercury Study, A Framework for Action, Feb. 1998 (NESCAUM, NEWMOA, NEIWPCC, EMAN).

⁶ Includes fossil-fueled and wood-fired commercial/industrial boilers and residential boilers. September, 2004 (7)

regulations do not require TMDLs for all waters, and that some waters may be excluded from Category 5 (an impaired water that requires a TMDL), and placed in Category 4B. In order to list a water under Category 4B, a state must demonstrate that other local, state, or federal pollution control requirements are expected to result in the attainment of all water quality standards ("WQS") in a "reasonable period of time" (Listing Guidance, p. 5). These control measures must be generally applicable to the impairment in question, reasonably expected to reduce pollutant loadings, and ultimately attain WQS when fully implemented (Listing Guidance, p.6). For controls required as part of an iterative or adaptive management program, a state must provide reasonable assurance that phased implementation will continue until WQS are achieved (Listing Guidance, p.7).

The Listing Guidance (p. 7) further recognizes that for nonpoint sources, the timeframe for achieving WQS may be difficult to predict, and that states have some flexibility in gauging whether the attainment will occur quickly enough to justify including a water in Category 4B. Factors that may influence a state's determination of what constitutes a reasonable time for attaining WQS include the cause of the impairment (the Listing Guidance expressly cites "atmospheric deposition" as an example), the nature of the control action, cost, public interest, etc. (Listing Guidance, p. 7).

The Listing Guidance also points out that whenever a TMDL identifies necessary reductions in pollutant loadings from nonpoint sources, such reductions may be implemented only under state law, because the federal Clean Water Act does not have a permit program for, or otherwise regulate pollutant loadings from, nonpoint sources (Listing Guidance, footnote 1, pp. 5-6).

The Listing Guidance (p. 3) expressly provides that in order to refine its listing classifications, a state may choose to establish new or additional listing subcategories.

Finally, the upcoming revised version of the Listing Guidance would need to expressly authorize states to pursue, as an alternative regulatory pathway, innovative pilot projects to address waters impaired by the atmospheric deposition of mercury.

ESTIMATED MERCURY LOADING REDUCTIONS NEEDED TO ATTAIN THE FISH-CONSUMPTION USE

While this document is submitted in lieu of developing a TMDL for every waterbody impaired by mercury, estimated loading requirements and associated assumptions pertaining to the fate and transport of mercury are herein presented based on recent guidance for the establishment of mercury TMDLs. This analysis is presented to provide perspective on the magnitude of mercury load reductions that would likely be required to alleviate mercury impairments, in comparison to modeled deposition loading rates from local and distant sources.

The goal of this alternative regulatory pathway is to have edible fish tissue meet the EPA target for human consumption (0.3 mg Hg/Kg or lower). A recent EPA document⁷ lists three possible approaches to developing a TMDL for Hg based on field studies, models or default values to estimate bioaccumulation factors. A second EPA document describes in detail an approach to modeling Hg bioaccumulation based on the premise that "The Mercury Maps Model states that a ratio reduction in air deposition watershed loads will produce an equivalent ratio reduction in fish tissue concentration in that watershed, at steady state."⁸, which is the approach used here. The mercury loading requirements estimated here rely on the following assumptions:

⁷ Methyl Mercury Fact Sheet. EPA-823-F-01-001 January 2001.

⁸ Cocca, P., A Quantitative Spatial Link between Air Deposition and Fish Tissue: Final Peer Reviewed Report. EPA-823-R-01-009 September, 2001.

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- 1) Large mouth bass, the dominant predatory fish species most widely monitored in Massachusetts lakes and ponds, usually contain the highest tissue concentrations of Hg in a given water body.
- 2) Hg concentration tends to increase with the size of the fish.
- 3) The highest tissue concentrations represent a combination of load, efficiency of methylation, and bioaccumulation. The relative influence of each factor is unknown and may vary.
- 4) For any given lake or pond the Hg concentration in fish tissue is a linear function of load. Also, the rates (efficiency) of conversion to methyl mercury and its bioaccumulation are constant. Thus, a reduction in load would result eventually in a proportional reduction in concentration in tissue.
- 5) Of the factors determining Hg's concentration in fish tissue, atmospheric load is the only one that can be readily controlled.
- 6) Meeting the target concentration in fish (i.e., bass) from the most impaired waterbody will automatically result in even lower concentrations in fish from other, less affected waterbodies.
- 7) This analysis applies only to those waterbodies (lakes and ponds) affected by air deposition and does not address to any great the degree Hg from waste sites or other local sources.

One caveat that needs to be recognized is the likelihood that there is an upper limit to the linearity of tissue concentration with mercury load. Also, reductions in Hg loads may take time before being reflected in reduced Hg concentrations in fish because of the reservoir of Hg available from past deposition and may plateau due to mobilization of reservoir mercury.

The target (average) concentration is 0.3 mg/kg as the upper limit in fish tissue for general consumption and, for purposes of this analysis, applies to the size of fish normally caught through recreational fishing. This criterion is based on human health considerations established by the EPA and represents, among other factors, a specific intake rate and a certain mix of fish species. The general assumptions appear adequate for this analysis. In essence, this means that meeting this target in the watersheds with the highest current concentrations of Hg in fish tissue will likely achieve concentrations proportionately lower in species and watersheds that now have lower concentrations with present loads.

A TMDL or equivalent loading analysis is typically presented as a concentration in water of the pollutant in question. In this case, because of the dynamics of mercury transformation and cycling, the same concentration could result in the different fish tissue concentrations of Hg. Thus for a constituent for which bioaccumulation is the primary concern, the target is more appropriately designated as a concentration in the tissue of the organism(s) of concern rather than as an ambient water concentration. A general ambient water concentration would be the appropriate target only if the bioaccumulation factors were the same in all waterbodies.

A waterbody's loading capacity for Hg is determined by several factors, not all of which are fully characterized. In most cases the Hg load resulting from atmospheric deposition is the sole controllable factor that helps determine the Hg concentration in fish tissue in a given waterbody. While the Hg concentration in fish tissue varies among lakes and ponds because of several factors, the key controllable factor is the Hg load. The premise of this analysis is that meeting the fish tissue concentration goal in the most afflicted waterbody through reduction of the Hg load from the atmosphere will achieve similar results for other lakes and ponds. This premise is consistent with

EPA's basic assumptions, as well (Cocca, P., A Quantitative Spatial Link between Air Deposition and Fish Tissue: Final Peer Reviewed Report. EPA-823-R-01-009, September, 2001.)

As previously noted the 1998 mercury deposition modeling estimated that 47% of the total anthropogenic mercury load originates from US sources within the Northeast Region with 53% attributable to sources outside the region.⁹ To meet the goal of 0.3 mg Hg/kg or less, a reduction in load of about 76% is estimated to be required for many MA waterbodies based on the assumption of linearity of Hg concentration in tissue and load. This is based on reducing the current maximum concentration encountered in non-point source impacted water bodies in MA, estimated to be 1.26 mg Hg/kg (see below for the development of the baseline of 1.26 mg Hg/kg), to 0.3 mg Hg/kg. This represents a reduction of 0.96 mg Hg/kg or 76% of 1.26 mg Hg/kg, exceeding the total contribution (47%) estimated to be attributable to in-region sources in the 1998 Northeast Regional Mercury Study. Although quantitative estimates are not yet available, this fraction is undoubtedly significantly lower today due to the substantial reductions in emissions that have been achieved in the region under the NEG-ECP MAP.

The Hg concentration from which the required reduction is calculated was derived from concentrations of mercury in edible tissue in large mouth bass from a study¹⁰ of 18 rural ponds across Massachusetts plus two standard deviations.¹¹ In this study by Rose, *et al.* the mean concentration in largemouth bass was 0.394 mg Hg/kg with a standard deviation of 0.165 (n=106) yielding an overall 95th percentile estimate of 0.724 mg Hg/kg.¹² For these water bodies to achieve the 0.3 mg Hg/kg target, an overall reduction of 0.424 mg Hg/kg, or 59%, would be required. The highest individual lake value in this study was 0.668 mg Hg/kg with a standard deviation of 0.298, yielding a 95th percentile value of 1.26 mg Hg/kg. In this case, to achieve the 0.3 mg Hg/kg target, an overall reduction of 0.96 mg Hg/kg, or 76%, would be required. The 95% value for four of the waterbodies included in this study (22% of the total) exceeded 1 mg Hg/kg. For each of these waterbodies, reductions of >70% would be needed to meet the criterion of 0.3 mg Hg/kg. In these cases the required reduction exceeds the upper bound estimate of the fraction of deposition attributable to in-region sources in 1998.¹³ Thus, while the effective programs underway to reduce mercury emissions in MA and New England are necessary to alleviate mercury impairments, they are likely to be insufficient by themselves to make our fish safe to eat without aggressive national actions to address out-of-region sources as well.

⁹ Northeast States and Eastern Canadian Provinces Mercury Study: A Framework for Action. February, 1998. Table VI-4, p. VI-16.

¹⁰ Rose, J. *et al.*, Fish Mercury Distribution in Massachusetts, USA Lakes. Environ. Toxicol. Chem 18:7 pp. 1370-1379, 1999.

¹¹ Maietta, R., A. Johnson, and R. A. Isaac. Fish tissue monitoring in Massachusetts. Paper AC92-020-003 presented at the Water Environment Federation 65th Annual Conference, New Orleans, 1992.

¹² The use of the 95th percentile value allows for the fact that some large and therefore more contaminated fish are caught. Thus, given the uncertainties in projections, using the 95th percentile value as the base line appears to be reasonable and protective.

¹³ In a second study of 24 lakes and ponds in northeast MA, which have been impacted by historical local air sources in MA and NH as well as out-of-region sources, the average mercury content of large mouth bass was 0.89 mg Hg/kg, with a standard deviation of 0.43. This data yields a 95th percentile value of 1.75 mg Hg/kg mercury. The highest mean individual lake value in this study exceeded 2.5 mg Hg/kg. Although these values are not directly comparable to those cited from the Rose *et al.* rural study (because they are size normalized) they do indicate that overall deposition reductions approaching 90% will likely be needed in many MA waterbodies to meet the 0.3 mg/kg criterion. Although substantial reductions in local sources have been achieved and more will occur, out-of-state sources may well preclude achieving the needed level of reduction even in these waters.

A PLAN FOR IMPLEMENTING THE ALTERNATIVE REGULATORY PATHWAY

Plan Overview

In light of the Listing Guidance framework and the mercury reduction target described above, set forth below is a summary of the array of regional, state and federal, adaptive management mercury controls that will, over an extended, but reasonable period of time (given the far-field sources of mercury and its persistence as a contaminant), address mercury impaired lakes and ponds in Massachusetts more effectively than the establishment of multiple TMDLs.

At the outset, it is important to emphasize that the Northeast states and Eastern Canadian Provinces have been leaders in actions to reduce mercury pollution. In light of above referenced findings of the 1998 *Northeast States and Eastern Canadian Provinces Mercury Study* that identified serious mercury impacts to the region, the leaders of the New England states and Eastern Canadian Provincial environmental agencies established a workgroup to develop a coordinated plan to address mercury in the region. This workgroup developed the *New England Governors and Eastern Canadian Premiers Mercury Action Plan*, (the “NEG-ECP MAP” or “MAP”) (<http://www.state.ma.us/dep/ors/files/negecp.pdf>) which was unanimously adopted by the region’s Governors and Premiers in June, 1998, at the 23rd annual meeting of the Conference of New England Governors and Eastern Canadian Premiers. The Regional Mercury Task Force, co-chaired by Massachusetts, reports back to the New England Governors and Canadian Premiers on the implementation of the MAP on an annual basis. Copies of the Task Force’s progress reports are attached to this proposal and may also be obtained from the New England Governors Conference.

The NEG-ECP MAP represents an important milestone for several reasons. First, the MAP is the first bi-national plan to address a toxic pollutant that was initiated and jointly endorsed by individual states of the United States and provinces of Canada and includes regional emission reductions that are significantly more stringent than relevant federal requirements of both the United States and Canada. Moreover, the MAP is comprehensive in nature and contains 45 specific elements in six major “Action Areas”. The MAP endorsed a precautionary approach to addressing mercury pollution and impacts in view of the wide geographic reach of mercury pollution, mercury’s classification as a PBT (“Persistent Bioaccumulative and Toxic”) pollutant, and the extensive data indicating that children and important natural resources were at risk in the region. As a result, the MAP expressly calls for comprehensive actions to the problem that extend beyond traditional media, programmatic and political boundaries. **The MAP established a regional goal of virtually eliminating anthropogenic mercury releases, with an interim 50% reduction target by 2003. Subsequently, a 75% reduction goal was established for 2010 and formally adopted by the Governors of the New England States and Premiers of the Eastern Provinces of Canada by resolution.** The MAP has been further endorsed and supported by the New England Governors and Canadian Premiers by signed resolution each year since its adoption. More specifically, the MAP (a) established a regional task force to implement the plan; (b) specified strict emission limits for major mercury sources that are considerably more stringent than federal requirements; (c) supports pollution prevention efforts to reduce mercury use in products and increase collection and recycling of mercury-added products where environmentally preferable alternatives do not exist; (d) directed state and provincial agencies to implement outreach and education programs about mercury and coordinate environmental monitoring efforts to track results; and (e) called for the retirement of the US federal strategic mercury stockpile.

To date the MAP has been a remarkable success. All of the New England states have developed, and implemented legislative and regulatory actions to address mercury sources. In MA statutory and regulatory authority presently exists to reduce air emissions, to require material separation and source reduction, and pretreatment of industrial and commercial wastewater.

Attachment A provides a partial list of MA DEP's existing statutory and regulatory authority to implement the MAP.

Attachment B to this proposal provides an update on "Mercury Reduction & Education Legislation in the Northeast" that was developed by NEWMOA. Additional information can also be found on NEWMOA's web site at the following locations <http://www.newmoa.org/Newmoa/htdocs/prevention/mercury/modelleg/Legislation-2003.cfm> and http://www.newmoa.org/Newmoa/htdocs/_prevention/mercury/modelleg.cfm. In addition to regulatory and legislative actions, the New England states have also implemented a number of mercury reduction programs, including but not limited to, public awareness and education programs; elemental mercury collection programs; product labeling; hospital and dentistry mercury reduction programs; and auto component source separation programs. A summary of these mercury reduction programs by state can be found at <http://www.newmoa.org/Newmoa/htdocs/prevention/mercury/programs/MercuryProgramList.cfm?sortorder=s>. Since 1998, the region has reduced mercury emissions by 55%, thus exceeding the 50% reduction target for 2003. Progress pursuant to the MAP is ongoing.

A critical contributor to the reduction of local and global mercury levels is source reduction. In 2000, Massachusetts adopted a *Zero Mercury Strategy* to further the goals of the MAP (http://www.state.ma.us/envir/sustainable/resources/pdf/Resources_Hg_Strategy.pdf). Thus, in addition to implementing the MAP, Massachusetts' Zero Mercury Strategy is also actively seeking to eliminate mercury sources. The Massachusetts Department of Environmental Protection ("DEP") estimates that, to date, our state has reduced mercury releases to the environment by between 60% and 70% compared to levels in the mid 1990's. Similar activities are taking place in most of the New England States. Actions are now being implemented that will result in further significant reductions in emissions in MA and across the region.

Vehicles for Implementing the Plan

The region's commitment to comprehensive controls on mercury was evidenced by the unanimous support for the MAP from the regions top political leaders, which extended across political lines. Signatories to the plan included Republican, Democrat and Independent Governors, as well as Premiers representing three political affiliations in Canada. Furthermore, the substance of the MAP is being implemented in accordance with established timelines by Massachusetts and the other regional parties through a combination of legislation, regulations, permitting and related compliance oversight. In addition to the MAP, Massachusetts' Zero Mercury Strategy is a complementary mercury reduction initiative that also represents an important set of mercury control measures. As described above, these plans are far reaching in scope and use all available regulatory and non-regulatory vehicles to ensure that the interim goals established therein are met while continued progress is made towards the virtual elimination of mercury sources in Massachusetts. The plans effectively rely on a combination of traditional end-of-the-pipe controls and pollution prevention efforts to address cross-media mercury pollution. Massachusetts and other states have also established a strategic mercury-monitoring plan to track emissions and environmental indicators relevant to mercury, including mercury-wet deposition and mercury in fish monitoring. This ongoing data collection effort will allow environmental results to be tracked and verified over time.

The resulting array of Massachusetts and regional legislation, regulation, policies, voluntary agreements, permits, support to communities to build capacity for mercury recycling and funding for outreach, monitoring and pollution prevention initiatives seek to systemically respond to all facets of the mercury pollution affecting our region. In almost all cases, the Massachusetts and regional response is substantially more stringent than, and goes beyond, federal requirements in this area. For example, the New England states have adopted mercury emission limits for large MSWCs that are 3-fold more stringent than the EPA requires, which has resulted in a 90% decrease in emissions from this sector. In Massachusetts, the smaller of these facilities are now

required to meet this limit by permit as well. The MAP limit for Municipal Waste Incinerators (MWIs) is 10-fold more stringent than the EPA requirements. In Massachusetts, all MWIs have ceased operations and alternative approaches are being used to sterilize medical waste that do not result in significant emissions of mercury. The MADEP recently promulgated regulations on coal-fired power plants that will reduce 85% of mercury emissions by 2008 and a 95% reduction by 2012, far exceeding proposed EPA requirements. All of the New England states have enacted legislation on mercury-added products that either require product labeling, ban certain unnecessary uses, and/or mandate collection and recycling of mercury from end-of-life products. In MA the sale of mercury fever thermometers has been banned and other more comprehensive mercury products legislation is under consideration by the legislature.

Pollution prevention has also been a focus of Massachusetts and other New England states. Massachusetts is the only state to require, by regulation, that MSWCs implement mercury pollution prevention programs to reduce the amount of mercury entering their combusted waste streams. Since the initiation of this state regulatory requirement two years ago, almost 2,000 pounds of mercury have been collected. Massachusetts also implemented a statewide mercury education and thermometer exchange program in 2001 that collected over 95,000 mercury fever thermometers. Finally, Massachusetts' ongoing school mercury cleanout initiative has to date collected almost 600 pounds of mercury from schools. In addition to the requirements for mercury source separation and recycling under the Commonwealth's Municipal Waste Combustor regulations, MA is continuing to pursue mercury products legislation to minimize mercury releases associated with products.

In summary, the mercury action plan of the New England states and Eastern Provinces of Canada, as enhanced by additional Massachusetts initiatives, demonstrates that there is a range of regional and state pollution control measures that, in aggregate, serve as an effective ongoing mechanism to address in-state and regional sources of mercury. Establishing individual TMDLs for the state's mercury impaired lakes and ponds will therefore shed little light on mercury sources that are in Massachusetts' or the region's ability to control. Combined, these programs represent a comprehensive, adaptive management strategy to reduce and eliminate mercury sources in Massachusetts and New England that have already achieved a regional mercury emission reduction of 55% and a MA reduction in excess of 60% over the last five years. Additional initiatives are also being implemented (coal-fired utility regulations; dental sector) that will advance the state and region towards the 2010, 75% reduction goal and virtual elimination. Although these reductions will not directly translate into a 1:1 decrease in overall mercury deposition, they will result in significant reductions in deposition and demonstrate a commitment to maximally reducing instate and in-region sources.

Timelines for Associated Actions

The MAP and Massachusetts' Zero Mercury Strategy include interim goals of a 50% reduction in mercury releases by 2003 and 75% by 2010. The long-term goal of each plan is the virtual elimination of manmade mercury pollution. A comprehensive range of individual actions under the plans also has timelines. For example, Massachusetts' Municipal Waste Combustor Rule required facilities with capacity of greater than 250 tons/day to meet a mercury emissions standard of 28 ug/dscm by December, 2000 and to optimize pollution controls for mercury. The remaining two smaller facilities in MA are also now held to this limit. The same limit is being applied in other states as well. In MA, these facilities are required under the states municipal combustor regulations to develop and implement materials separation plans for products containing mercury. These plans have diverted over 2,000 pounds of mercury from the solid waste stream over the last 2 years. The MA MSWC regulations alone are estimated to have reduced mercury emissions from Massachusetts's facilities from approximately 6,000 pounds per year to less than 600 pounds (see Figures 1 and 2). Most of the New England states have also adopted, or are in the process of adopting, similarly stringent mercury emissions limits (see previous website citation for legislative and regulatory updates).

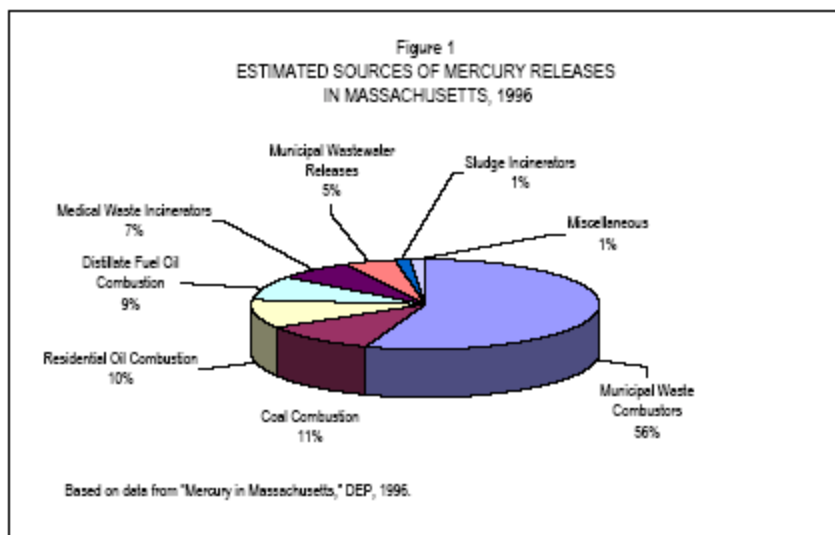
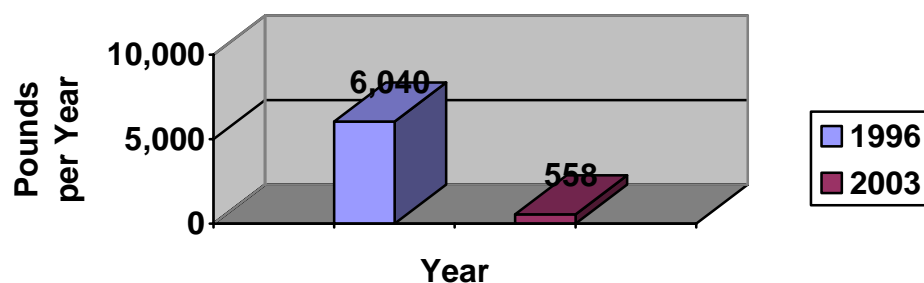


Figure 2
Estimated Mercury Releases From
Municipal Waste Combustors, Reductions as a Result of
Municipal Waste Combustor Rule



In addition, Massachusetts and most other New England states recently initiated dental mercury-recycling programs with incentives to encourage the early installation of amalgam separators that will reduce mercury discharges to wastewater by 95%. The dental sector is estimated to contribute a significant fraction (30-70%) of mercury loadings to municipal wastewater, thus contributing to emissions from sewage sludge incinerators, direct water discharges in effluent and in combined sewer overflows, and releases attributable to sludge reuse. Massachusetts established a two-year deadline to achieve 90% participation, after which DEP will adopt mandatory regulations requiring the use of amalgam separators.

Prior to the NEG-ECP MAP medical waste incinerators were a significant regional source of mercury emissions. Because of the stringent emission limit advanced under the MAP as well as

other federal and requirements addressing dioxin emissions, all MWIs in MA and most in the region have ceased operation, reducing mercury emissions from this sector by 98%.

MA and the region are also addressing mercury emissions from coal-fired utilities, the largest national source emissions. In the spring of 2004, MA adopted the most stringent regulations on mercury emissions from coal-fired power plants in the nation. Under the first phase of these regulations MA coal-fired power plants are required to control emissions by 85% by 2008. Phase 2 takes effect in 2012 when these plants will need to control emissions by 95%. CT has adopted legislation requiring 90% control efficiency by 2008 and NH is considering similarly stringent limits.

Mercury emissions from another major source, the region's two chloralkalai facilities (one in ME and one in NH) have been reduced by over 93%.

Ensuring that the required range of federal, regional and state controls are being implemented and maintained in an ongoing and timely manner constitutes a reasonable approach and timeframe for ultimately attaining designated uses. In Massachusetts' view, the Listing Guidance for Category 4B provides the flexibility needed to accommodate our implementation plan, which goes several steps beyond the current federal regulatory scheme and is a model of regional coordination and collective action.

ANTICIPATED DECREASES IN FISH TISSUE MERCURY LEVELS

Although the rate of response of change in mercury concentrations in fish in relation to decreased waterbody inputs is a complex phenomenon and will likely vary between waterbodies, current information indicates that fairly rapid (on the order of years rather than decades), and substantial, reductions in mercury fish tissues levels are likely to occur in response to reduced atmospheric deposition. Current data from environmental monitoring, experimental and modeling studies suggest that these decreases are likely to occur on a near one-to-one basis.

As previously noted the EPA's *Mercury Maps* model, which relates changes in mercury air deposition rates to changes in mercury fish levels, indicates that, for long-term equilibrium conditions, the ratio of current to future air deposition rates will equal the ratio of current to future fish tissue concentrations (<http://www.epa.gov/waterscience/maps/>). This model predicts a linear relationship between reduced atmospheric inputs and mercury levels in fish. Results from the Florida TMDL study also indicate a linear response over time periods of one to two decades with only a slight departure from a one-to-one relationship due to remobilization of previously deposited mercury from sediments (http://www.epa.gov/owow/tmdl/hg_tmdl_pilot.pdf).

Recent data from experimental isotopic mercury addition studies in the Florida Everglades and boreal watersheds in northwest Ontario provide mechanistic insight into the relationship between atmospheric deposition and mercury levels in biota. In summary, these studies indicate that newly deposited mercury is more readily methylated than existing mercury pools¹⁴. Thus, decreased inputs of new mercury result in decreased levels in biota, which occur fairly quickly over time scales of multiple years rather than many decades. Environmental monitoring data from the Everglades has also documented decreases in fish tissue mercury level over the past decade or so, which correspond to decreased emissions and deposition in the area (<http://www.floridadep.org/labs/mercury/docs/flmercury.htm>). Massachusetts has established a strategic monitoring program to follow longer-term trends in fish tissue mercury levels across the state. This network will allow the Commonwealth to assess progress in a reproducible and

¹⁴ Cynthia Gilmour, Andrew Heyes, Robert Mason, Carrie Miller and Michale Rearick. *Response of Methyl Mercury Production to Changes in Hg Loading: A Comparison of Hg Isotope Addition Studies*. STAR Mercury Fate and Transport Final Progress Review Workshop.

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quantifiable manner. Very preliminary data suggest that a statistically significant decrease in mercury levels in fish from lakes and ponds in the northeast part of the Commonwealth may already be occurring as a result of emission reductions achieved under the NEG-ECP Mercury Action Plan and the MA Zero Mercury Strategy.

IDENTIFICATION OF WATERS COVERED BY THE ALTERNATIVE REGULATORY PATHWAY

Massachusetts is petitioning the EPA to exempt from the calculation of individual TMDLs those lakes and ponds that are believed to be impaired by mercury from atmospheric sources. Waterbodies near known or suspected local sources of mercury, such as waste sites, are not to be covered by the Alternative Regulatory Pathway Proposal. Furthermore, rivers, impoundments located on mainstem rivers, and coastal segments impaired by mercury are not included in this proposal due to the history of industrial development, wastewater discharges, waste sites and other sources of "legacy" pollutants affecting these waters in Massachusetts. It is quite possible that some of these are impaired solely by atmospheric sources and so will be proposed for coverage under the Alternative Regulatory Pathway when this can be confirmed. TMDLs or the equivalent waste-site cleanup plans will continue to be relied on for managing waters where local sources of mercury are implicated.

To facilitate the review of the Alternative Regulatory Pathway Proposal a compilation of those lakes and ponds to be covered by the proposal was formulated through a review of the proposed 2004 Integrated List, the Water Body System (WBS) database that stores the assessments and related information, and the list of fish consumption advisories issued by the Massachusetts Department of Public Health (DPH). Information pertaining to the EPA Superfund (National Priority List) sites and state-only hazardous waste sites in Massachusetts was then reviewed to determine which sites have mercury listed as a site-contaminant. Lakes, ponds and impoundments situated adjacent to or downstream from these sites were not included on the list of waters to be covered by the Alternative Regulatory Pathway Proposal because considerable uncertainty exists with regard to contributions of mercury from those sites relative to atmospheric loadings.

A total of 90 lakes and ponds were identified through the above screening process. The complete list can be found in the Appendix.

SUMMARY

The implementation plan outlined above is a comprehensive, adaptive management approach that is directed at removing mercury impairment of Massachusetts' lakes and ponds through regulatory mercury emission reduction controls and complementary pollution prevention measures. The State's efforts will also help to address mercury deposition impacts in downwind areas. Given that the parameter of concern is atmospheric mercury deposition, it is appropriate that the implementation plan is regional in scope and includes control measures that primarily, but not exclusively, focus on attaining substantial reductions in mercury air emissions.

As evidenced by the ongoing character and level of governmental commitment to the MAP and the resulting legislation, regulation, permits and compliance oversight, Massachusetts can thereby provide reasonable assurance to EPA that its phased implementation plan will continue until WQS for the impaired lakes and ponds are met. As MA sources are controlled, out-of state sources will increasingly be responsible for remaining mercury deposition impacts in the state. These out-of-state sources must be addressed nationally. Massachusetts is making a reasonable assumption that the EPA's own existing and ongoing regulatory program under the federal Clean Air Act and other relevant statutes and regulations will ultimately impose controls on mercury sources located outside of New England sufficient to, over time, result in reductions in atmospheric mercury deposition affecting Massachusetts' lakes and ponds and allow designated uses to be achieved. Given that Massachusetts does not have state law authority to directly regulate these far-field mercury air emissions, independent from or as part of a TMDL, it is appropriate for the purposes of any of the Category 4 listing options identified by Massachusetts to rely on ongoing and adaptive management of federal control measures as the means of addressing the contribution of those mercury sources to the impairment of Massachusetts' lakes and ponds. Should these federal efforts prove insufficient to address the problem, MA may at a later time complete mercury loading assessments of waterbodies to determine source inputs and take appropriate action to ensure that out-of-state sources are sufficiently controlled. In any event, the alternative of requiring Massachusetts to develop multiple TMDLs is not an efficient or effective control mechanism in these circumstances and will not accomplish the purpose of the CWA listing process, which is to identify impaired waters and to bring them into compliance with WQS as soon as practicable.

Rather than identify a specific date by which the mercury impaired lakes and ponds will attain WQS, Massachusetts' is affirming that its iterative, adaptive management implementation plan will continue until WQS are attained. This approach includes specific deadlines for various mercury reduction requirements and regulations. This approach is consistent with the Listing Guidance, which recognizes that when the cause of the impairment is atmospheric deposition the timeframe for achieving WQS may be difficult to predict. Moreover, factors such as the necessity of ongoing, coordinated and complementary federal, regional, and state controls to address the full range of mercury sources impairing Massachusetts waters realistically preclude the establishment of a definitive attainment date. More importantly, Massachusetts' ongoing commitment to implementing its comprehensive plan in concert with its regional partners, together with relying on the EPA's continued regulation of mercury sources nation-wide, constitutes a "reasonable period of time" within the meaning of any of the Category 4 listing options identified by Massachusetts.

In the event that the EPA determines that Massachusetts' proposal to list its mercury impaired lakes and ponds under Category 4B does not strictly comport with the requirements of that subcategory because, e.g., the date of attainment of WQS for these waterbodies cannot be estimated with enough precision or occur quickly enough to justify including them under Category 4B as presently defined by EPA, then Massachusetts is proposing to establish a new listing subcategory under 4D or implement its plan as an innovative pilot project also authorized as a new category in the Listing Guidance. All of the above approaches are for waters that are

impaired by atmospheric mercury deposition caused, in large part, by far-field sources that are beyond the reach of state regulatory authority. Massachusetts' implementation plan, as described in this proposal, would satisfy the requirements of the new Category 4 by providing a comprehensive set of alternative pollution controls that will, in phases and over time, effectively address the mercury impairment. Massachusetts is also providing reasonable assurance to EPA of its open-ended commitment to implement such controls until attainment of WQS is achieved. For the purposes of the new Category 4, this adaptive management approach constitutes a "reasonable time period" for attainment of WQS in the context of the far-field derived atmospheric mercury deposition impairment affecting Massachusetts' lakes and ponds.

In closing, the EPA has promoted the value of developing innovative approaches to environmental protection in an era of limited agency resources. Massachusetts, in turn, specifically developed this mercury Alternative Regulatory Pathway option under the EPA's Innovations Program. Using an already established, comprehensive and effective regional action plan as an alternative to the resource intensive effort of developing individual TMDLs to address atmospheric mercury deposition in Massachusetts' lakes and ponds is both justified and to be encouraged.

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APPENDIX 1

Letters of support for the proposal.

1) Letter of support from the New England Governors and Eastern Canadian Premiers (NEG/ECP) Committee on the Environment.

July 23, 2004

Michael O. Leavitt
Administrator
U.S. Environmental Protection Agency
1101A U.S. EPA Headquarters
Ariel Rios Bldg.
Washington, DC 20460

Dear Administrator Leavitt:

The Environment Committee of the Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP) represents the environmental agencies of the New England States and Eastern Canadian provinces. The Committee is writing to express its unanimous support for the tri-state Total Maximum Daily Load (TMDL) alternative proposal entitled ***Mercury Impaired Waterbodies: Category 4 Mercury TMDL Alternative Regulatory Pathway Proposal***, which is being submitted to the U.S. EPA by Massachusetts, Maine and Rhode Island as part of their 303(d) impaired waters list.

This proposed TMDL alternative is based on the substantial mercury pollution reductions that have been achieved across New England and the Eastern Canadian Provinces through the NEG/ECP Mercury Action Plan, which was adopted in 1998. The proposal is designed to streamline state efforts and avoid the diversion of scarce resources away from the actual *mercury reduction activities* underway through the NEG/ECP Mercury Action Plan, which would be needed to comply with the traditional TMDL *process*. This proposal was developed under the U.S. EPA Innovations program and was recently submitted to EPA New England for consideration and was presented at the Innovation Action Council meeting in Washington, DC in May 2004, where it was positively received.

Briefly, the states propose to rely on the NEG/ECP Mercury Action Plan in lieu of waterbody-specific TMDLs for lakes and ponds impacted primarily by air deposited mercury. Under this approach, these lakes and ponds would be assigned to category 4 (either category 4B or a new category created specifically for mercury impaired waters from air deposition). Requiring waterbody-specific TMDLs for air-impacted waterbodies makes little sense for the New England States. All jurisdictions in the region are already taking steps to maximally reduce mercury pollution under the NEG/ECP Mercury Action Plan, state enforceable regulatory programs and related voluntary efforts. In most cases these efforts go well beyond federal requirements. State efforts under the NEG/ECP Mercury Action Plan are effectively addressing those mercury sources that can be controlled by individual states in New England. Future mercury impacts will increasingly be attributable to sources that our region has no direct control over, rendering state waterbody-specific TMDLs an ineffective approach.

Substantial reductions in mercury pollution have been, and will continue to be, achieved under the NEG/ECP Mercury Action Plan. The region has exceeded its goal of 50% mercury reduction in 2003, and will most likely exceed its goal of 75% reduction by 2010, and is committed to the ultimate goal of virtual elimination. These reductions will assure substantial improvements in local mercury loadings to regional waterbodies and provide reasonable assurance that water quality standards will be met in the future if similarly stringent mercury reduction commitments are adopted nationally and internationally. The Plan also includes mechanisms to assure continued progress and to demonstrate improvements in water quality over time.

In conclusion we urge you to accept this innovative proposal.

Sincerely,

Jeff Wennberg
Commissioner, Vermont Dept. of Environmental Conservation
Co-chair, NEG/ECP Committee on the Environment

Hermel Vienneau
Deputy Minister, New Brunswick Dept. of Environment & Local Government
Co-chair, NEG/ECP Committee on the Environment

cc: NEG/ECP Coordinating Committee
Bob Varney & Ira Leighton, EPA Region 1
Ben Grumble & Diane Regas, EPA Headquarters
Stéphane Dion, Environment Canada

2) Letter of support from the Association of State and Interstate Water Pollution Control Administrators



Association of State and Interstate
Water Pollution Control



Administrators

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202.898.0929 • WWW.ASIWPCA.ORG

September 15, 2004

Michael O. Leavitt
Administrator
U.S. Environmental Protection Agency
1101A USEPA Headquarters
Ariel Rios Building
Washington, D.C. 20460

Dear Administrator Leavitt:

The Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) is writing to express its support for a Total Maximum Daily Load (TMDL) alternative proposal entitled ***Mercury Impaired Water Bodies: Category 4 Mercury TMDL Alternative Regulatory Pathway Proposal***. It is our understanding that the proposal is being submitted to USEPA by the states of Massachusetts (MA), Maine (ME) and Rhode Island (RI), as part of their §303(d) impaired waters list. This TMDL alternative is

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consistent with the positions of ASIWPCA previously communicated to the Administrator in a correspondence dated 11/02/01. It is also consistent with the Environmental Council of States (ECOS) Quicksilver Caucus report to USEPA titled *Elements for Developing a National Mercury Reduction Strategy to Achieve Water Quality Standards* and with ECOS resolution 03-07, *Need for a National Mercury Reduction Strategy as an Option for Atmospheric Mercury Total Maximum Daily Load (TMDL)*.

As articulated in the correspondence, resolution and report, ASIWPCA members believe that requiring water body-specific TMDLs for air-impacted water bodies makes little sense. Many States are already implementing programs to address those mercury pollution sources that are under their control. Individual State and Regional efforts addressing mercury also reduce loadings to downwind States, helping them achieve water quality standards as well. For any individual State or Region, future mercury impacts will increasingly be attributable to sources that individual States have no direct control over, rendering State water body-specific TMDLs an ineffective approach.

The joint State (MA, ME and RI) proposal was developed under the USEPA Innovations Program. These States can demonstrate that efforts currently underway have resulted in significant reductions in mercury sources in each jurisdiction. These efforts are being implemented through a comprehensive regional action plan and State mercury reduction plans with elements that exceed federal requirements. Substantial data demonstrate that these plans are being effectively implemented and monitored. Under this proposed TMDL alternative, lakes and ponds impacted primarily by air deposited mercury would be assigned to category 4 (either category 4B or some new category created specifically for waters impaired by mercury air deposition). Water bodies would remain in this category as long as the States continue to effectively implement the reduction plans. If approved, this proposed alternative approach would avoid needless TMDL analysis that would merely divert scarce State resources away from actual mercury reduction activities underway in the proponent States.

State mercury reduction efforts will assure substantial improvements in local mercury loadings to water bodies and provide reasonable assurance that water quality standards will be met in the future, should a comprehensive national strategy addressing mercury be developed and adopted. In the interim, States implementing strategies addressing mercury sources within their borders should not be required to expend scarce resources on the TMDL process to demonstrate what is already known, i.e. that National and International reductions, in addition to State efforts, are needed to address many mercury-impaired water bodies.

In conclusion, ASIWPCA urges you to accept this innovative proposal and to extend its availability to all States with similar mercury reduction plans.

Sincerely,



Arthur Guy Baggett, Jr.
President

Cc: ASIWPCA Membership
Robbi Savage, Executive Director
Ben Grumbles, Acting USEPA Assistant Administrator for Water
USEPA Regional Water Divisions Directors, I-X
Diane Regas, Director, USEPA Office of Wetlands, Oceans and Watersheds

APPENDIX 2

Lakes and Ponds to be Managed by the Alternative Regulatory Pathway

WATER BODY	MUNICIPALITY	Proposed 2004 LIST CATEGORY
Aaron River Reservoir	Cohasset, Hingham	4B/4D
Ames Pond	Tewksbury	4B/4D
Ashumet Pond	Mashpee	4B/4D
Assabet River Reservoir	Westborough	5
Lake Attitash	Amesbury, Merrimac	4B/4D
Baldpate Pond	Boxford	5
Bare Hill Pond	Harvard	4C
Big Pond	Otis	5
Boons Pond	Stow, Hudson	4C
Buffumville Lake	Charlton, Oxford	4C
Burr's Pond	Seekonk	4B/4D
Chadwicks Pond	Haverhill, Boxford	4B/4D
Chebacco Lake	Hamilton, Essex	4C
Lake Cochichewick	North Andover	4B/4D
Cornell Pond	Dartmouth	5
Crystal Lake	Haverhill	4B/4D
Lake Dennison	Winchendon	4B/4D
East Brimfield Reservoir	Brimfield	4C
Flint Pond	Tyngsborough	5
Forest Lake	Methuen	5
Fosters Pond	Andover	5
Gales Pond	Warwick	5
Gibbs Pond	Nantucket	4B/4D
Great Herring Pond	Bourne, Plymouth	4B/4D
Great South Pond	Plymouth	4B/4D
Haggetts Pond	Andover	4B/4D
Hamblin Pond	Barnstable	4B/4D
Hickory Hills Lake	Lunenburg	4B/4D
Holland Pond	Holland	4B/4D
Hood Pond	Ipswich	4B/4D
Hoveys Pond	Boxford	4B/4D
Johns Pond	Mashpee	4B/4D
Johnsons Pond	Groveland, Boxford	5
Kenoza Lake	Haverhill	4B/4D
Lake Lashaway	North Brookfield, East Brookfield	4C
Lewin Brook Pond	Swansea	4B/4D
Locust Pond	Tyngsborough	4B/4D
Long Pond	Dracut, Tyngsborough	5
Long Pond	Rochester	4B/4D
Lowe Pond	Boxford	4C
Martins Pond	North Reading	5
Mashpee Pond	Mashpee, Sandwich	4B/4D
Massapoag Lake	Sharon	4C
Massapoag Pond	Dunstable, Groton, Tyngsborough	5
Miacomet Pond	Nantucket	4B/4D

Mill Pond	Burlington	4B/4D
Millvale Reservoir	Haverhill	4B/4D
Monponsett Pond	Halifax	4B/4D
Newfield Pond	Chelmsford	5
Lake Nippenicket	Bridgewater	4C
Noquochoke Lake	Dartmouth	5
North Watuppa Lake	Fall River	4B/4D
Nutting Lake	Billerica	4C
Otis Reservoir	Otis, Tolland, Blandford	4B/4D
Pentucket Pond	Georgetown	5
Lake Pentucket	Haverhill	4B/4D
Peters Pond	Sandwich	4B/4D
Plainfield Pond	Plainfield	4B/4D
Pomps Pond	Andover	4C
Pontoosuc Lake	Lanesborough, Pittsfield	4C
Populatic Pond	Norfolk	5
Pottapaug Pond Basin	Petersham	4B/4D
Quabbin Reservoir	Petersham, Pelham, Ware, Hardwick, Shutesbury, Belchertown, New Salem	4B/4D
Quacumquasit Pond	Brookfield, East Brookfield, Sturbridge	4C
Rock Pond	Georgetown	4B/4D
Lake Rohunta	Athol, Orange, New Salem	5
Lake Saltonstall	Haverhill	4B/4D
Sheep Pond	Brewster	5
Silver Lake	Wilmington	4B/4D
Snake Pond	Sandwich	4B/4D
Snipatuit Pond	Rochester	4B/4D
Somerset Reservoir	Somerset	4B/4D
Stevens Pond	North Andover	4B/4D
Sudbury Reservoir	Marlborough, Southborough	4B/4D
Tom Nevers Pond	Nantucket	4B/4D
Turner Pond	New Bedford, Dartmouth	4B/4D
Upper Naukeag Lake	Ashburnham	4B/4D
Upper Reservoir	Westminster	4B/4D
Wachusett Reservoir	Boylston, West Boylston, Clinton, Sterling	4B/4D
Waite Pond	Leicester	4B/4D
Wakeby Pond	Mashpee/Sandwich	4B/4D
Walden Pond	Concord	5
Lake Wampanoag	Ashburnham, Gardner	4B/4D
Warners Pond	Concord	4C
Wenham Lake	Beverly	4B/4D
Wequaquet Lake	Barnstable	4C
Whitehall Reservoir	Hopkinton	5
Whiting Pond	North Attleborough, Plainville	4B/4D
Wickaboag Pond	West Brookfield	4B/4D
Willet Pond	Walpole, Westwood, Norwood	4B/4D

ATTACHMENT A

MA Statutory and Regulatory Authority to Regulate Mercury

1. Solid Waste	Legislative Authority:	M.G.L. Chapter 21H M.G.L. Chapter 111, 150A –150A ½
	Regulatory Authority:	310 CMR 16.00 310 CMR 19.00
2. Air Pollution	Legislative Authority:	M.G.L. Chapter 111, s. 2b&2c M.G.L. Chapter 111, s. 142A
	Regulatory Authority:	310 CMR 7.29 (emissions for power plants) 310 CMR 7.08(2) (municipal waste combustors) 310 CMR 6.00 to 8.00
3. Medical Waste	Legislative Authority:	M.G.L. Chapter 111, s. 127A
	Regulatory Authority:	105 CMR 480
4. Toxics Use Reduction	Legislative Authority:	M.G.L. Chapter 211, s. 3 & 10-12
	Regulatory Authority:	310 CMR 50
5. Emergency Response	Legislative Authority:	M.G.L. Chapter 21E
	Regulatory Authority:	310 CMR 40.000
6. Environmental Results Program	Legislative Authority:	M.G.L. Chapter 21, s. 26-43, M.G.L. c. 21C, M.G.L. c.21E, M.G.L. c 111, s. 142A-J
	Regulatory Authority:	310 CMR 70.0-72.0
7. Water Pollution Control/Industrial Pretreatment	Legislative Authority:	M.G.L. Chapter 21, s. 26-53
	Regulatory Authority:	257CMR 2.00, 310 CMR 41.00, 314 CMR 1.00 -15.00

A complete list of Massachusetts' regulations can be found at <http://www.mass.gov/dep/matrix.htm>

Other guidance documents on the regulation of mercury can also be found at the following web sites:

Solid Waste: <http://www.mass.gov/dep/bwp/dswm/dswmpubs.htm#regs>

Air Quality: <http://www.mass.gov/dep/bwp/daqc/daqcpubs.htm#regs>

Toxics Use Reduction: <http://www.mass.gov/dep/bwp/dhm/tura/policies.htm>

Mercury Regulations: <http://www.gov/dep/bwp/hgres.htm>

Final Mercury Regulations for Power Plants: <http://www.mass.gov/dep/bwp/daqc/files/regs/hgreg.pdf>

Municipal Waste Combustor Regulations: <http://www.mass.gov/dep/bwp/daqc/files/mwcregs.pdf>, see also

Material Separation Plan Guidance for Municipal Combustors

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ATTACHMENT B

MERCURY REDUCTION & EDUCATION LEGISLATION IN THE NORTHEAST

<http://www.state.ma.us/dep/bwp/daqc/daqcpubs.htm#regs>

Prepared by Terri Goldberg, NEWMOA

October 27, 2003

Note: The following is a report prepared by NEWMOA and Northeast environmental agency staff and reflects the status of mercury-product legislation in the northeast as of the summer of 2003. Further information on mercury legislation through 2004 can be found in the NEWMAO report "Status of Local, State and Federal Mercury Product Legislation and Laws: 2003-2004 Legislative Sessions" at <http://www.state.ma.us/dep/bwp/daqc/daqcpubs.htm#regs>.

During the past three years, the Northeastern states have initiated several major legislative efforts designed to reduce mercury releases to the environment attributable to products. The key goals of these efforts are to make information readily available to the public about mercury-containing products; reduce unnecessary uses of mercury-added products where environmentally preferable alternatives exist; and increase the collection of mercury-added products used by consumers. Considerable progress has been made regionally to advance these objectives.

Table 1 shows the Mercury Education and Reduction Legislation that has been introduced or enacted in each state legislature by summer 2003. More detailed summaries of the legislation, in alphabetical order by state, can be found in the following sections or at <http://www.state.ma.us/dep/bwp/daqc/daqcpubs.htm#regs>

Table 1

Status of Mercury Education and Reduction Legislation in the Northeast as of June 2003

Requirement	CT	ME	MA	NH	NJ	NY	RI	VT
Mercury-added Product Notification	✱	✱	✓	✱		✓	✱	✓
Interstate Clearinghouse	✱	✱	✓	✱			✱	✓
Bans on Certain Hg-Added Products	✱	✱	✓	✱	✓	✓	✱	✓
Novelty ban	✱		✓	✱		✓	✱	✓
Thermometer ban	✱	✱	✱	✱	✓	✓	✱	✓
				✱			✱	

School ban		★	✓					✓
Manometer ban	★	★	✓	✓		✓	★	✓
Phase-Out & Exemptions	★	★	✓	✓		✓	★	✓
Labeling	★	★	✓	✓		✓	★	★
Disposal Ban	★	★	✓	✓		✓	★	✓
Collection System Plans	★		✓	✓		✓	★	
Disclosure		★	✓			✓	★	
Control on Sale of Elemental Mercury	★	★	✓	★		✓	★	✓
Public Education and Outreach	★	★	✓	★		✓	★	★
Universal Waste Rule	*	*	*	*	*	✓	★	✓
State Procurement		*	✓	✓			★	✓
Education on Dental Amalgam		★	✓	★		★		
Dental Amalgam Separators Required		★	✓	★				
Dental Amalgam Collection						★		
Mercury Auto Switch Phase-out & Removal		★		✓		✓	✓	

★ = Provisions that have been passed this year or previous years

✓ = Provisions proposed in 2002 and/or 2003

* = Authority exists to implement under existing laws or policies

Connecticut

A law (CGS Chapter 446m) that includes most of the provisions of the NEWMOA Model Mercury Education and Reduction Legislation passed both houses of the Connecticut state legislature and was signed by Governor Rowland in 2002. The bill implements a phase-out of mercury-added products, product labeling, bans on certain mercury products, collection programs, a disposal ban, and controls on the sale of elemental mercury.

<http://www.cga.state.ct.us/2002/act/Pa/2002PA-00090-R00HB-05539-PA.htm>

In 2003 several bills (HB 6401, HB 6402, HB 66623, SB 1157) have been introduced that would modify the 2002 law by changing certain definitions and exempting certain products from labeling.

<http://prdbasis.cga.state.ct.us/BASIS/TSAMDHP/LIN1/AMD/MSF>

Maine

A bill (PL 2003, chapter 6 [LD 385]) that changes the initial reporting date for the mercury switch removal program for motor vehicles passed both houses of the state legislature and was signed by Governor John E. Baldacci in 2003. The first report is now due January 1, 2004. <http://www.mainelegislature.org/legis/bills/billtexts/ld038501-1.asp>

<http://janus.state.me.us/legis/LawMakerWeb/summary.asp?LD=385>

A bill (PL 2003, chapter 301 [LD 697]) that requires dental offices to install amalgam separators by December 31, 2004 passed both houses of the state legislature and was signed by Governor John E. Baldacci in 2003. If a separator was installed prior to March 20, 2003, such units must achieve a minimum of 95 percent removal efficiency, while separators installed on or after that date must have a minimum of 98 percent removal efficiency, with efficiencies to be determined by ISO 11143.

<http://www.mainelegislature.org/legis/bills/billtexts/LD069701-1.asp>

<http://janus.state.me.us/legis/LawMakerWeb/summary.asp?LD=697>

A bill (PL 2003, chapter 221 [LD1159]) that, with some exceptions, bans the sale of mercury switches, relays, and measuring devices (with some exceptions) as of July 1, 2006 passed both houses of the state legislature and was signed by Governor John E. Baldacci in 2003. Measuring devices include barometers; esophageal dilators, bougie tubes and gastrointestinal tubes; flow meters; hydrometers; hygrometers and psychrometers; manometers; pyrometers; sphygmomanometers; and thermometers.

<http://www.mainelegislature.org/legis/bills/ld.asp?LD=1159>

A bill (PL 2003, chapter 150 [LD 743]) that bans the incineration and landfill disposal of cathode ray tubes after January 1, 2006, in part due to the mercury in these products, passed both houses of the state legislature and was signed by Governor John E. Baldacci in 2003. The Department of Environmental Protection is required to prepare a recommended plan for collection and recycling of CRTs and submit the plan to the legislature by January 30, 2004.

<http://www.mainelegislature.org/legis/bills/billtexts/ld074301-4.asp>

<http://janus.state.me.us/legis/LawMakerWeb/summary.asp?LD=743>

A bill (LD 1549) that provides revenue from a fee on paints and related materials and pesticides to help fund municipal collection of household hazardous waste (HHW) was introduced in 2003. The money would be used, among other thing, to help implement the state ban on disposal of mercury-added products from households, which takes effect in January 2005. The fee provisions were approved by the House and Senate, but subsequently were removed to avoid a veto by the Governor. The bill, as enacted, calls for further study of funding options for HHW collection.

<http://janus.state.me.us/legis/LawMakerWeb/externalsiteframe.asp?ID=280010499&LD=1549&Type=1>

Maine passed two mercury bills in 2002—one bill requires a phase-out and collection system for mercury-added light switches in cars and the other requires a mercury-added thermostat phase-out and ME DEP to develop a report with recommendations on further mercury-added product phase-outs.

The auto switch bill (LD 1921) does the following: 1) prohibits the sale of mercury switches in automobiles as of January 1, 2003; 2) requires mercury switches and mercury headlamps to be removed from end-of-life vehicles before they are flattened or crushed; and 3) requires automobile manufacturers to establish a statewide system to collect, consolidate, and recycle the switches. A bounty of \$1 is provided for people who remove switches and return them for recycling, with the money to be provided by the auto manufacturers.

<http://janus.state.me.us/legis/ros/lom/lawsrch.htm>.

The mercury-added product phase-out bill (LD 2004) requires the ME DEP to summarize the mercury products data provided under the manufacturer notification law enacted last year and, by January 1, 2003, to submit a report to the Legislature with recommendations for reducing the use of mercury in products. The law also prohibits the sale of new mercury thermostats in residential and commercial buildings, effective January 1, 2006.

<http://janus.state.me.us/legis/status/gateway.asp?LD=2004>.

In 2001 Maine enacted a bill that requires notification by manufacturers before they can sell a mercury-added product in the state, bans the sale of mercury fever thermometers, and requires manufacturers to disclose the mercury content of certain products sold to hospitals. Maine has also been implementing a mercury labeling law that was passed in the 1999 legislative session.

<http://janus.state.me.us/legis/stratutes/38/title38ch16-BSEC0.html>

Massachusetts

A bill (H3772) that bans the sale of mercury-added fever thermometers was enacted in 2002.

For the past three years the Massachusetts legislature has considered comprehensive legislation that includes most of the provisions of the NEWMOA Model Mercury Education and Reduction Legislation. Legislation introduced this session (S692, H2482) is being considered by the Joint Committee on Natural Resources and Agriculture. If enacted, the legislation would require product labeling, mandate phase-outs and ban sales of certain mercury products, require manufacturers to pay for mercury collection programs, direct manufacturers to test and disclose the mercury content of certain products used by health care facilities, ban the landfill disposal of mercury-added products, authorize the state to participate in a multi-state clearinghouse, and eliminate the use of mercury products in schools.

Separate legislation (H1906, H3003) was filed to address mercury-containing vehicle switches. The legislation requires vehicle manufacturers to establish recycling programs to remove mercury switches from end-of-life vehicles and phase-out use of mercury components in new vehicles.

As of June 2003 these Bills were under consideration by the Joint Committee on Natural Resources and Agriculture. The current bill can be found at: <http://www.state.ma.us/legis/bills/st00692.htm> or <http://www.state.ma.us/legis/history/s01269.htm>

A bill (H2341) would require dentists to: post and distribute information for patients about the mercury content of amalgam fillings; avoid using amalgam fillings for dental restoration in pregnant women and young children; recycle amalgam with licensed companies; install amalgam separators with 99 percent removal efficiency; and clean their pipes and plumbing. As of June 3, the bill was under consideration of the Joint Committee on Health Care.

A bill (HB 1165) would require owners of commercial, industrial, institutional, governmental, and multi-residential properties of six units or more to establish recycling programs and to notify their tenants and building occupants of programs. The program would have required implementation of collection and recycling activities for most products that can be recycled, including mercury-added waste products. As of June 2003 the bill was under consideration by the Joint Committee on Natural Resources and Agriculture. The bill can be found at: <http://www.state.ma.us/legis/bills/house/ht01165.htm> or <http://www.state.ma.us/legis/history/h01165.htm>

A bill (SB 1269) directs each city and town to develop a Clean Sweep facility to be open at least one day a week and collect a wide range of products, including fluorescent lamps, batteries, and mercury-added products, such as fluorescent lamps, thermometers, and thermostats. As of June 2003 the bill was under consideration by the Joint Committee on Natural Resources and Agriculture. The bill can be found at: <http://www.state.ma.us/legis/bills/st01269.htm> or <http://www.state.ma.us/legis/history/s01269.htm>

New Hampshire

A bill (HB 1251) requiring dentists and the department of health and human services to provide information on restorative dental materials, including mercury amalgams, and requires the department of environmental services to adopt rules for the disposal of mercury amalgam waste in an environmentally-appropriate manner was passed in 2002. The notification provisions are similar to those passed in Maine in 2001; this is the first time in the U.S. that state legislation requires a state to adopt rules for dentists to install "environmentally appropriate disposal equipment" to trap mercury. The bill can be found at:

<http://www.gencourt.state.nh.us/legislation/2002/HB1251.html>.

A bill (HB 1418) that bans the sale of mercury thermometers without a prescription and the sale of novelty items containing mercury, such as games, toys, clothing and ornaments was enacted in 2000. The legislation limits the sale of elemental mercury to a few specific purposes and prohibits the use of mercury and mercury compounds in science labs in grades K-12. The legislation also requires that manufacturers of mercury-added products, such as fluorescent lamps, batteries, thermostats, and electrical switches, notify the state about how much mercury is contained in their products. Finally, the bill requires NH DES to create a public outreach and education program on the hazards of mercury and ways to reduce the amount of mercury into the environment.

Two mercury reduction bills were introduced in the 2003 legislative session: an auto switch bill and a bill to

regulate mercury-added products. The auto switch legislation (SB 185) would ban the sales of vehicles with mercury switches and require auto manufacturers to develop and fund a collection program for switches. This bill was vote inexpedient to legislate. The mercury-added products bill (HB366) would require mercury-added product labeling, impose a disposal ban, and modify state procurement provisions. This bill was retained by the Science, Technology, and Energy Committee and worked on during the off-season and reintroduced next year.

New Jersey

A bill was introduced in the House and Senate to ban the sale of mercury fever thermometers. Action on the bill is still pending in the legislature. The bill can be found at: http://www.njleg.state.nj.us/2002/Bills/S0500/371_11.HTM

New York

A law requiring dentists to use pre-encapsulated elemental mercury; and to recycle elemental mercury, mercury capsule waste, and dental amalgam based on rules and regulations established by the NYS DEC Commissioner was signed by Governor Pataki in 2002.

A bill (A05932) that provides for: disclosure of mercury content, phase-out of mercury-added products, disposal prohibition, labeling, source separation, collection, requirements for sewage treatment plants, point source release containment traps, ban on sale or distribution of certain mercury products, replacement of manometers and gas pressure regulators (agriculture dept. to handle for dairy industry), regulates dental use and bans health insurance discrimination therein, requires lamp recycling; adds all mercury-added products to state universal waste rules; provides for a state advisory committee on mercury pollution; provides for penalties for violations was introduced in 2003. It has been referred to Environmental Conservation. The bill can be found at: <http://assembly.state.ny.us/leg/?bn=A05932>

A bill (A06219) that would prohibit the sale of mercury fever thermometers has been introduced in 2003. It has been referred to Environmental Conservation. The bill can be found at: <http://assembly.state.ny.us/leg/?bn=A06219>

A bill (A06259) that would require automobile manufacturers to establish and implement plans which provide for the removal, replacement, collection and recovery of mercury-added components from motor vehicles currently on the road or about to be scrapped; such plans shall be subject to the review and approval of the commissioner of environmental conservation; requires mercury-added components to be removed from motor vehicles prior to recycling; requires manufacturers to phase-out the use of mercury-added components in new cars; establishes civil penalties for violations; grants a preference to mercury-free vehicles in state purchasing was introduced in 2003. It was referred to Environmental Conservation. The bill can be found at: <http://assembly.state.ny.us/leg/?bn=A06259>

A bill (A06416) that would prohibit use, purchase and storage of mercury and mercury instruments in schools was introduced in 2003. It was referred to the Education Committee. The bill can be found at: <http://assembly.state.ny.us/leg/?bn=A06416>

A bill (S03604) that would prohibit the use of mercury-containing gauges and manometers and the sale of mercury-containing fever thermometers; define terms; and provide for civil penalties for violations was introduced in 2003. It was referred to Environmental Conservation Committee. The bill can be found at: <http://assembly.state.ny.us/leg/?bn=S03604>

Rhode Island

A law that included most of the provisions of the Model Mercury Education and Reduction Legislation was passed by the Rhode Island General Assembly in 2001. This legislation requires the phase-out of mercury-added products, labeling, collection plans, bans on certain products, elimination of mercury from schools, and many other provisions. Rhode Island's mercury education and reduction law, as adopted in 2001, can be found at:

<http://www.rilin.state.ri.us/PublicLaws/law01/law01318.htm>

In 2003, a number of legislative initiatives were proposed to modify the 2001 legislation by changing some of the critical definitions in the legislation and delaying its implementation. Other bills would have mandated new mercury reduction requirements (e.g., disposal of lamps). These proposals were actively debated before the House Committee on Health, Education and Welfare and the Senate Committee on Environment and Agriculture. They can be found at:

H-6149: <http://www.rilin.state.ri.us/BillText/BillText03/HouseText03/H6149.htm>

H-6196: <http://www.rilin.state.ri.us/BillText/BillText03/HouseText03/H6196.htm>

H-6197: <http://www.rilin.state.ri.us/BillText/BillText03/HouseText03/H6197.htm>

S-0029: <http://www.rilin.state.ri.us/BillText/BillText03/SenateText03/S0029.htm>

S-1194: <http://www.rilin.state.ri.us/BillText/BillText03/SenateText03/S1194.htm>

In 2003, environmental groups introduced legislation (H 5356, S-0275, S-0640, and S-0853) to address mercury switches in cars. These bills would have required vehicle manufacturers to develop and implement a plan to remove and recover mercury switches with a minimum 90 percent capture rate. These bills were referred to the House Committee on Environment and Natural Resources and the Senate Committee on Environment and Agriculture. The General Assembly ultimately decided not to move forward with any auto-mercury legislation in 2003. The text of these bills can be found at:

H-5356: <http://www.rilin.state.ri.us/BillText/BillText03/HouseText03/H5356.htm>

S-0275: <http://www.rilin.state.ri.us/BillText/BillText03/SenateText03/S0275.htm>

S-0640: <http://www.rilin.state.ri.us/BillText/BillText03/SenateText03/S0640.htm>

S-0853: <http://www.rilin.state.ri.us/BillText/BillText03/SenateText03/S0853.htm>

Members of the RI Senate proposed a Resolution (S-0851) that encourages schools to participate in the mercury free schools program to eliminate or reduce and manage mercury-containing items within their schools. It was referred to Senate Environment and Agriculture Committee, which ultimately recommended that the measure be held for further study. The bill can be found at:

<http://www.rilin.state.ri.us/BillText/BillText03/SenateText03/S0851.htm>

Ultimately, only two bills addressing mercury-added products were enacted in 2003 in Rhode Island. Both serve to roll back many of the provisions of the 2001 RI Mercury Education and Reduction law. S-0578 Sub A as amended and H-6610 were adopted by the RI General Assembly and sent to the Governor on July 7, 2003 and July 9, 2003 respectively. These two bills took effect July 15, 2003 and July 17, 2003, respectively, without the Governor's signature.

These identical bills amend the state's 2001 Mercury Reduction and Education Act, providing more time to meet the standards, and setting up a 14 person advisory committee to provide the Governor and the General Assembly with several reports with recommendations for reducing and eliminating mercury hazards in Rhode Island. Phase-out requirements were extended from July 13, 2003 to July 1, 2005 for those products with greater than 1,000 milligrams or 250 parts per million (ppm) mercury; from July 13, 2005 to July 1, 2007 for those products with greater than 100 milligrams or 50 ppm mercury; and from July 13, 2007 to July 1, 2009 for those products with greater than 10 milligrams or 10 ppm mercury. Specialized lighting used in the entertainment industry was exempted from these bans. Labeling requirements, disposal bans and the requirement for manufacturers to either set up their own or a cooperative collection system for their products were all delayed until July 1, 2005. In addition, novelties incorporating one or more mercury-added button cell batteries as their only mercury-added component(s) are no longer subject to the ban on the sale, use, or distribution of mercury-added novelties. Under the 2001 law, the exemption had applied only to novelties with *replaceable* mercury-added button cell batteries. These bills can be found at:

PL Chapter 328 (H-6610): <http://www.rilin.state.ri.us/PublicLaws/law03/law03328.htm>

PL Chapter 235 (S-0578Aaa): <http://www.rilin.state.ri.us/PublicLaws/law03/law03235.htm>

Vermont

A bill (S91) was introduced in the Senate that contains most of the provisions of the model legislation (except for disclosure and collection system plans) in 2002. The bill includes requirements for mercury-added product notification, phase-out, disposal ban, interstate clearinghouse, and product bans. The Senate passed the bill in April 2002. A vote in the House is not likely this session. These bills can be found at: <http://www.mercvt.org>

ATTACHMENT C

MERCURY EMISSION REDUCTIONS UNDER PHASE 1 OF THE NEW ENGLAND GOVERNORS AND EASTERN CANADIAN PREMIERS MERCURY ACTION PLAN

August, 2004

Prepared by NESCAUM and the New England Governors and Eastern Canadian
Premiers Mercury Task Force

Introduction: The following provides a summary of New England (NE) and Eastern Canadian Provinces (ECP) regional mercury emissions reductions achieved since the adoption of the New England Governors and Eastern Canadian Premiers Mercury Action Plan (NEG_ECP MAP). Results are compared to the baseline inventory presented in the 1998 Northeast States and Eastern Canadian Provinces Mercury Study: A Framework for Action. Emissions data as reported by all jurisdictions for the 2002-2003 timeframe are included in the assessment.¹⁵

Summary: This assessment of mercury emission reductions from sources in the New England States and Eastern Canadian Provinces was completed by the Northeast States for Coordinated Air Use Management (NESCAUM) and the New England Governors and Eastern Canadian Premiers (NEG-ECP) Mercury Task Force. This assessment indicates that there has been an overall decrease in mercury emissions from the baseline reported in the 1998 Regional Mercury Study of approximately 55%, exceeding the regional 2003 50% emission reduction goal established in the NEG-ECP Mercury Action Plan.

Discussion: The New England and Eastern Canadian Provinces air quality agencies provided mercury emission information for sources included in the 1998 Northeast Regional Mercury Study baseline emissions inventory. Updated inventory data was collected for sources where regulatory or other actions to reduce actual mercury emissions were implemented since the 1998 NEG-ECP MAP was adopted. A more robust inventory update is being developed by NESCAUM, which will address additional sources identified as potential contributors to regional mercury releases since the 1998 baseline assessment. This inventory will include revised emissions estimates based on new emission factors, the addition of new source categories as appropriate (e.g. iron and steel manufacturing, mobile sources), and updates of emission estimates for area sources and residential heating. This Phase 2 inventory will serve as a baseline for assessing progress towards the 75%, 2010 reduction target and will be completed over 2004-2005.

¹⁵ The values herein have been updated to reflect data from all jurisdictions. Thus, these final estimates are slightly different from the draft estimates previously reported in June, 2003.

Summary Findings: Emission reduction estimates for the NE-ECP region since the mid-1990s are presented in Table 1.¹⁶ These reductions in point source emissions¹⁷ translate to a 55% overall decrease in mercury emissions in the NE-ECP region since the inception of the NEG-ECP Mercury Action Plan.

Table 1: Summary of Mercury Emission Reduction in New England and Eastern Canada (metric tons/year)

	New England	Eastern Canadian Provinces ¹	Total	Percent Reduction
1998 Baseline	7.08	2.74	9.82	55% (rounded)
2003 Estimate	2.85	1.55	4.40	

¹ Including Quebec. Note that the original 1998 baseline did not include an emissions inventory for Quebec and could arguably be excluded from the analysis. Since Quebec was able to provide baseline 1998 emission estimates, the MTF decided to include this data in the analysis. If the Quebec inventory was not included, the overall emission reduction estimate would be 57.5%.

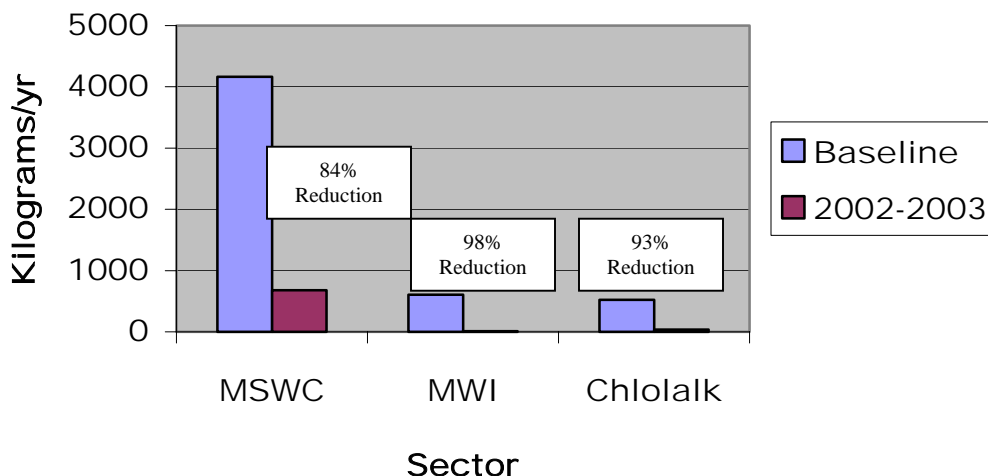
Emission Reductions From Specific Source Categories:

Municipal Solid Waste Incinerators (MSWC); Medical Waste Incinerators (MWI) and Chloralkali facilities (Chloralk). As illustrated in Figure 1 below, significant emission reductions occurred in these three categories. Municipal waste combustors achieved an 84% overall regional reduction in emissions since adoption of the NEG-ECP MAP. This was accomplished through the use of new pollution controls required to meet the stringent emission limits cited in the NEG-ECP MAP. Over this period emissions from medical waste incinerators were reduced by over 98%, largely due to the closure of many facilities in response to tightened emission limits for mercury and dioxins and the use of improved pollution controls and pollution prevention programs at the small number of facilities still in operation. The region's two chloralkali facilities reduced releases of mercury by 93% over this timeframe. This reduction resulted from the closure of one facility in Maine and reductions at the other facility in New Brunswick, achieved through the use of improved process controls and best management practices.

¹⁶ The inventory in the 1998 regional mercury study did not include a detailed emission breakout for Quebec. Since then a detailed inventory has been provided with estimates of baseline and 2003 mercury emissions. The percent reduction values presented here include the Quebec values.

¹⁷ As discussed below, it is important to note that mercury-added waste products also contribute to environmental releases of mercury through direct volatilization when broken and through wastewater related discharges. Although reductions in such releases are likely to have occurred in the region as a result of pollution prevention activities under the NEG-ECP MAP, updated release estimates from these pathways were not available and were thus not included in this inventory.

Figure 1: Regional Emission Reductions from Major Source Categories



Area Sources. The emissions estimate for area sources was not revised due to data gaps for emissions from this diverse source category. However, emissions reductions from some sources included in this category are likely to have occurred in the region. For example, substantial reductions in releases from the off-gassing of mercury from old mercury-added paints, sold and applied prior to the national sales ban on these products that went into effect in May of 1991, will have occurred over the past five years. Real reductions in releases from broken products are also likely, due to expanded regional pollution prevention and recycling efforts. On the other hand, recent data indicates that releases attributable to broken products were likely underestimated in the initial inventory. Overall, the MTF believes that some modest reduction in total emissions from this category has probably occurred. However, because of the uncertainties, a conservative approach was taken and emission reductions in this category were not included in the percent reduction analysis.

Utilities. In 2003 coal-fired utilities were the major unregulated source of mercury emissions in the region. Over the past few years, a modest reduction (about 10%) in emissions was achieved by some Canadian facilities due to a switch from high mercury local coals to lower mercury fuels. Available data also indicate that current pollution controls, installed at some coal-fired boilers in the region to reduce other pollutants (e.g. particulates and acid gases), are also capturing a significant amount of mercury that would otherwise be emitted. As noted in previous MTF and jurisdictional reports, additional opportunities exist to further reduce these emissions. These are being actively pursued across the region. In summary, recent legislative and regulatory developments in MA, CT and NH, will result in further substantial reductions in mercury emissions from this category. The efforts underway in New England to address coal-fired utility mercury

emissions exceed those currently proposed by USEPA by a substantial degree. Legislation adopted in CT in 2003 requires a 90% control of mercury emissions from coal-fired facilities in that state. Regulations adopted by MA in the spring of 2004 require 85% and 95% control of mercury emissions from coal-fired utilities by 2008 and 2012, respectively. Requirements proposed by NH in 2004 would reduce emissions by >80% by 2012.

Other Sources. A modest increase in regional emissions from sewage sludge incinerators was reported. Efforts are underway across the region to reduce these emissions through pollution prevention (P2) initiatives, targeting the health care sector, dental sector and consumer products. In 2002, the NEG-ECP endorsed a goal of having at least 50% of the region's dentists who work with mercury amalgam install amalgam separators. These units capture >95% of the mercury that would otherwise enter wastewater and sludge through the installation, shaping and removal of mercury amalgam fillings. Because all jurisdictions are targeting this sector, the region will likely exceed the 50% goal, resulting in a substantial reduction in mercury in sewage sludge.

Relatively minor changes in actual emissions from other source categories (e.g. residential fuel oil combustion; industrial oil combustion etc.) are likely to have occurred. For oil combustion, initial baseline emission estimates were likely high. These will be revised as part of the Phase 2, baseline inventory update discussed above.

ATTACHMENT D

Reducing Mercury and Acid Rain Precursor Emissions from Boilers: Status Report of Jurisdictional Progress and Strategies

Based on a June 16, 2003 status report prepared by the New England Governors and Eastern Canadian Premiers Mercury Task Force and NESCAUM With Updated Information for the New England States

BACKGROUND AND STATEMENT OF CHARGE

The following status report was completed by the NEG-ECP Joint Boiler Workgroup's Mercury Task Force members. The NEG-ECP Joint Boiler Workgroup was established at the direction of the Governors and Premiers as a partnership of the NEG-ECP Acid Rain Steering Committee and the Mercury Task Force to evaluate emission control technology options and emission reduction targets for boilers and to explore strategies to achieve multi-pollutant emission reductions in this sector. For various reasons, the Joint Boiler Workgroup was unable to convene over the past year. Because the Mercury Action Plan established a deadline of 2003 for jurisdictional strategies to address mercury emissions from boilers, the Mercury Task Force has completed the following status report.

Both the Mercury and Acid Rain Action Plans recognize the significance of the electric utility boiler sector in the emission of mercury and acid rain precursors (sulfur dioxide – SO₂, and nitrogen oxides - NO_x). Reducing emissions of mercury, SO₂ and NO_x from this sector, both within the region and outside of it, is central to the implementation of both plans. Since significant amounts of mercury and acidifying emissions, along with other emissions of environmental concern, are emitted from this sector, and these may be controlled to varying degrees by the same air pollution control devices (APCDs), the NEG-ECP Committee on the Environment concluded in 2000 that it was important to take a multi-pollutant approach to emission control strategies for this sector. Multipollutant considerations and assessments are also generally requested and valued by industry, which has urged this approach to so as to provide predictable and cohesive targets to assist in longer-term fiscal, capital and capacity planning.

This status report provides a summary of regional actions to address emissions of acidifying pollutants and mercury from boilers in the region, with a particular focus on the later pollutant. The Mercury Action Plan and subsequent resolutions adopted by the NEG-ECP identified actions and timelines to address mercury emissions from boilers and directed the Mercury Task Force to report back on progress in this area in 2003. The Mercury Action Plan recommendations pertaining to boilers state that:

“The Mercury Task Force shall identify mercury emission control options and

regional emission reduction targets for these sources within one year, using the best available information. This evaluation should include an assessment of any national actions in this area and, as necessary, pilot studies of the effectiveness and feasibility of identified emission control technologies.” and,

“Based on these evaluations, the respective jurisdictions will develop and implement regional strategies to promote maximum economically and technically feasible reductions in mercury emissions from utilities and other boilers in the northeast. The implementation of these efforts should commence within 5 years (by the year 2003).”

The Acid Rain Action Plan also identified boilers as a major source of acidifying emissions both nationally and within the region and presented emission reduction targets for this sector as well.

STATUS OF JURISDICTIONAL MERCURY AND ACIDIFYING EMISSION REDUCTION STRATEGIES FOR COAL-FIRED BOILERS.

INTRODUCTION

In July 2000, the Joint Boiler Workgroup released a report entitled “Technology Options and Recommendations for Reducing Mercury and Acid Rain Precursor Emissions from Boilers”. This report concluded that coal- fired utility boilers are the predominant source of mercury emissions from this category, and are a significant source of acid rain precursor and climate change emissions as well. The report concluded that reductions in mercury emissions from coal- fired boilers in the region in the range of 20-50% by 2005 and 60-90% by 2010 were achievable. An update of this report was completed in 2002, taking into consideration additional information that became available since the first report was completed. That update reaffirmed the major conclusions in the 2000 report.

The following update is based on responses to a region-wide survey, prepared by the MTF, on the status of jurisdictional mercury and acidifying emission reduction strategies in the region. At this time information has not been received from all jurisdictions. Thus, the numbers cited in this draft will change somewhat as new data is received. However, the MTF does not believe the final values cited herein will be close to those reported in this draft.

REGIONAL OVERVIEW

In total, there are >13 coal-fired electric generating facilities currently in operation in the New England States and Eastern Canadian Provinces (data on the total number of facilities from one Canadian jurisdiction, with approximately 1,200 MW total coal-fired generating capacity, was not available at the time this update was prepared). The 13 facilities have a generating capacity of approximately 3,667 MW, which combined with the additional 1,200 MW capacity noted earlier, accounts for approximately 13 % of the total electrical generating capacity in the region.

Mercury emissions from *all* coal-fired utility facilities in the region are estimated to have been approximately 1,200 pounds per year in the mid-late 1990's. 2003 emissions were estimated to be approximately 1,100 pounds per year. Regional mercury emissions from this sector were originally estimated to total about 1,400 pounds per year in the 1998 regional mercury report. This estimate was based on the best information available at that time. More recent data indicate that baseline emissions were likely to have been somewhat higher for some jurisdictions and lower for others. In total, regional baseline mercury emissions were likely to have been somewhat lower overall- 1,200 pounds per year- than originally estimated. This value primarily reflects a reduction attributable to improved emissions information. This new baseline value was incorporated in the inventory used to evaluate progress towards the 50% 2003 interim reduction goal. Emission reductions were, however, only credited where actions that resulted in actual reductions occurred (i.e. from some facilities that shifted from using high mercury coal to lower mercury fuels resulting in a real reduction in emissions- these were counted towards the reduction goal.)

Thus, the coal- fired utility sector constitutes somewhat more than 10% of estimated current mercury emissions and is the largest remaining unregulated major point source category, and the second largest overall source, of mercury emissions in the region. Despite the fact that mercury emissions have been reduced by over 85% since 1998, with most units achieving well over 90% control of mercury, MSWCs remain the largest regional emissions category, totaling approximately 1,500 pounds per year. Many regional actions to further reduce emissions from this sector are underway, including legislation reducing mercury use in products and their disposal, as well as extensive mercury collection and recycling efforts. These will lead to significant further reductions in emissions from this sector in the future.

As noted previously, based on the 2000 Joint Boiler Workgroup report as well as the follow-up MA control technology report (see below for further discussion), 85-90% or greater control of emissions from the coal-fired utility sector was deemed feasible. The MTF also concluded that reductions in that range would be needed in order to achieve the 75% regional mercury reduction target by 2010 and to ensure continued progress towards the virtual elimination goal articulated in the MAP.

The following presents summaries of key jurisdictional efforts to address mercury emissions from the utility sector including the number of coal-fired facilities, their generating capacity and estimated mercury emissions. This summary is based on information submitted by the air programs of each jurisdiction in response to a survey by the MTF and the Joint Boiler Group, which was distributed in March 2003.

JURISDICTIONAL SUMMARIES

NEW BRUNSWICK

Facilities. Of 2003, New Brunswick had two coal- fired generating facilities with a total capacity of approximately 540 MW.

Mercury Emissions. Total mercury emissions in the mid- late 1990's are estimated to have been about 370 pounds. Current emissions are estimated to be 290 pounds. It is important to note that substantial mercury emissions reductions have been achieved over The past decade by NB utilities that are not reflected in these totals. In 1994, the New Brunswick Power Corporation (NB Power) converted the Dalhousie Generating Station from burning coal and heavy fuel oil to burning Orimulsion fuel. Extensive air pollution control equipment (WFGD, CS-ESP, WESP) was also installed. The coal that was burned at Dalhousie was indigenous to New Brunswick with relatively high mercury content (0.5 ppm Hg). Switching fuels at this power plant reduced mercury emissions by approximately 440 pounds per year. Because this reduction preceded the baseline inventory, it is not reflected in the % reduction for NB.

New Brunswick currently has two remaining coal- fired facilities. The use of indigenous New Brunswick coal at one facility ceased as of January 1, 2002 and it is estimated that this reduced mercury emissions by approximately 20 kilograms per year.

Prior to the year 2010, NB Power plans to either retire or refurbish with extensive air pollution control equipment, its second coal-fired facility. This facility burns coal indigenous to New Brunswick that is relatively high in mercury (0.5 ppm Hg). Retiring this power plant would reduce mercury emissions by approximately 100 kilograms per year. Refurbishing it would result in substantial emission reduction. As part of the development process of the Canada-wide Standard for mercury emissions from coal-fired power plants, NB Power will be conducting stack testing to better quantify mercury emissions from these two facilities prior to December 2004.

MASSACHUSETTS

Facilities. Massachusetts has 4 coal- fired utility facilities with a total generating capacity of approximately 1,810 MW.

Mercury Emissions. Based on recent stack test results and yearly heat input data, MA facilities are estimated to have emitted about 185 pounds of mercury per year in the late 1990s. Current emissions are estimated to be about the same, with some variability due to normal year-to-year fluctuations in heat input attributable to plant utilization rates which vary depending on factors such as maintenance, power demand and pricing.

Mercury Emissions. In May of 2001, MA adopted new utility regulations (310 CMR 7.29- Emissions Standards for Power Plants), which imposed several requirements regarding mercury emissions. These regulations required DEP to take certain actions designed to provide information to develop a proposed mercury standard for facilities by June, 2003. Specifically, MA coal- fired electric generating units were required to conduct speciated mercury stack and inlet tests, as well as analyses of the mercury content of the coal combusted. These tests were completed in 2002. The results indicate

that the existing pollution control devices installed at MA facilities to reduce emissions of other pollutants are also achieving substantial mercury emission reductions, averaging in the range of 56-86%, depending on the unit.

The MA utility regulations also required MADEP to complete a feasibility report regarding control of mercury emissions. This report, "Evaluation Of The Technological And Economic Feasibility Of Controlling And Eliminating Mercury Emissions From The Combustion Of Solid Fossil Fuel," was completed in Dec. 2002. It can be found at <http://www.state.ma.us/dep/bwp/daqc/daqcpubs.htm>. In summary, this report concluded that mercury control in the range of 85-90% or greater is technically and economically feasible for this sector.

MADEP adopted final mercury emission regulations for coal-fired utility Boilers in May 2004. The regulations took effect on June 4, 2004 (<http://www.state.ma.us/dep/bwp/daqc/daqcpubs.htm#regs>). These regulations will ultimately result in a reduction of about 155 pounds of mercury emissions from the four coal-fired power plants each year. The regulations will be implemented in two phases. In Phase 1, by January 1 2008 each facility must capture at least 85% of the mercury in the coal burned by the facility or emit no more than 0.0075 pounds of mercury per net gigawatt-hour of electricity generated (calculated as a rolling annual average). In Phase 2, by October 1 2012 each facility must capture at least 95% of the mercury in the facility's coal or emit no more than 0.0025 pounds of mercury per net gigawatt-hour of electricity generated (calculated as a rolling annual average).

NEW HAMPSHIRE

Facilities. Two coal- fired electric generating facilities, comprised of five units with a total capacity of approximately 589 MW are operational in New Hampshire.

Mercury Emissions. Mercury emissions from these facilities were estimated by the New Hampshire Department of Environmental Services to be approximately 134 pounds per year. The New Hampshire Clean Power Act requires the NH Department of Environmental Services (DES) to propose an annual mercury budget for PSNH Merrimack Units 1 and 2 in Bow, NH; PSNH Units 4, 5, and 6 in Portsmouth, NH; and PSNH Unit #1 in Newington, NH no later than March 31, 2004 with timely consideration (of this budget) by the legislature expected by July 1, 2005. NH DES has completed a draft proposal that, subject to legislative approval, will result in emission reductions of about 60% by 2008 and 80%+ by 2011.

CONNECTICUT

Facilities. Connecticut has two coal- fired generating facilities with a capacity of approximately 610 MWs.

Mercury Emissions. CT DEP estimates that these facilities emit approximately 70

pounds of mercury per year. In June 03, Governor Rowland signed legislation, *AN ACT CONCERNING MERCURY EMISSIONS FROM COAL-FIRED ELECTRICITY GENERATORS*, which requires coal-burning electric plants to reduce the amount of mercury they emit, starting July 1, 2008. In summary the bill:

1) requires plant owners or operators to meet a mercury emissions rate equal to or less than (a) 0.6 pounds of mercury per trillion British thermal Units (tBTU), or (b) a 90% reduction from the amount of mercury introduced into the system, whichever is more readily achievable; 2) requires the use of continuous emissions monitors for mercury if the commissioner determines that they are commercially available and can perform according to National Institute of Technology Standards or other approved EPA-approved methodology; and 3) authorizes the commissioner to set alternative emission limits as if the plants cannot meet requirements with properly installed and operating control technology. The commissioner must establish the alternative limits by April 1, 2010 based on the units control technology's optimized performance. Additionally, on or after July 1, 2012, the Commissioner of Environmental Protection may adopt regulations, in accordance with the provisions of chapter 54 of the general statutes, imposing mercury emission limits that are more stringent than such emissions requirements provided for in subsection (a) or (b) of section 2 of this act.

ATTACHMENT E

Dental Program Update Summary for the Northeast States & Eastern Canadian Provinces

The following is based on a regional status report prepared by the NEG-ECP MAP Task Force in June 2003 with updated information for several of the New England States.

In 2003, the NEGC/ECP Mercury Task Force recommended, and the Governors and Premiers concurred, that the region adopt as a goal for the dental sector that 50 percent of dental offices in the Region install amalgam separators by 2005. All jurisdictions are now implementing programs to address this sector. The following provides a status report on these efforts.

Northeast States

Connecticut – Best Management Practices for Dental Practitioners

Connecticut mercury reduction legislation passed in 2002 requires the DEP to adopt best management practice(s) to prevent the discharge of mercury to the waters of the State, any pollution abatement facility or subsurface sewage disposal system and to promote the proper handling and recycling or disposal of waste elemental mercury and amalgam. The law also requires that the purchaser or recipient of elemental mercury be provided a Material Safety Data Sheet.

Under the Connecticut program, dental practices must certify that they are in compliance with a number of best management practices, including the use of an amalgam separator. The BMP requirements include:

1. Amalgam substitutes should be used in cases where they are appropriate as determined by the dental professional when determining the best treatment option for the patient.
2. Single use amalgam capsules should be used in dental offices.
3. Empty amalgam capsules (after mixing amalgam), that contain no visible amalgam, should be disposed of as a solid waste.
4. All contact and non-contact scrap amalgam should be salvaged and stored in separate containers. The containers should be structurally sound and labeled as to the contents (Example – hazardous waste: contact amalgam). The container should be tightly closed except when adding or removing scrap amalgam. If the amalgam is stored under water, then the water may not be poured down the drain or in the trash. The water must be managed through an amalgam recycler or hazardous waste hauler.
5. Amalgam separation units must be installed and maintained. Amalgam separator units shall at all times meet the ISO 11143 standard of a minimum of 95% mercury removal. Spent amalgam filters shall be recycled or treated as a

- hazardous waste. The separator should be inspected and filter changed in accordance with manufacturer specifications. The separator should be installed centrally so that wastewater from all suction lines passes through it.
6. Spilled amalgam should be swept up immediately and placed into an amalgam container.
 7. When changing or cleaning pipes, the dental office should inspect for the presence of historical mercury amalgam. If amalgam is present, it should be removed and treated with other amalgam waste.

For further information, visit www.dep.state.ct.us/wst/mercury/mercury.htm

Maine – Amalgam Separator Legislation

A bill (PL 2003, chapter 301 [LD 697]) that requires dental offices to install amalgam separators by December 31, 2004 passed both houses of the state legislature and was signed by Governor John E. Baldacci in May 2003. If a separator was installed prior to March 20, 2003, such units must achieve a minimum of 95 percent removal efficiency, while separators installed on or after that date must have a minimum of 98 percent removal efficiency, with efficiencies to be determined by ISO 11143. The bill can be found at:

<http://www.mainelegislature.org/legis/bills/billtexts/LD069701-1.asp>
<http://janus.state.me.us/legis/LawMakerWeb/summary.asp?LD=697>

Massachusetts – Dental Amalgam Mercury Recycling Program

The Massachusetts Executive Office of Environmental Affairs (EOEA) and Department of Environmental Protection (DEP) have entered into a partnership with the Massachusetts Dental Society to promote proper management of mercury amalgam waste and wastewater. In addition, EOEA funded a study by researchers at the University of Massachusetts Boston to evaluate the performance of four dental amalgam separator technologies, make recommendations based on the researcher's findings and to propose a practical protocol for evaluating the efficiency of amalgam separator technologies..

Through these efforts the Massachusetts Department of Environmental Protection (DEP) initiated in 2003 a voluntary program for dental practices and facilities to certify to DEP that they are using amalgam separators, a number of best management practices and are recycling amalgam waste containing mercury. This program is intended to reduce the amount of mercury released into the environment by Massachusetts dental practices and facilities. Amalgam waste from the dental sector contributes to the mercury released into the environment from Massachusetts sources, and was identified in the "Zero Mercury Strategy" adopted by the Massachusetts Executive Office of Environmental Affairs in 2000 as a potential candidate for pollution prevention

Dental practices and facilities that certify in the program's first year (before February 1, 2005) will be exempt from upcoming DEP regulations relating to the installation, operation, maintenance, and upgrading of amalgam separation systems and from related DEP fees through January 31, 2010 (See "DEP Regulations" below). Depending on participation rates the voluntary program may be extended for a second year. Dental practices and facilities that certify between February 1, 2005 and January 31, 2006 will be exempt until February 1, 2007.

DEP is implementing this voluntary approach to encourage early installation and use of amalgam separators by dentists before the agency adopts regulations that would require these actions. The voluntary program is focused on dental practices and facilities that are likely to generate waste amalgam containing mercury: general dentists, pediatric dentists, endodontists, and prosthodontists (oral surgeons, periodontists and orthodontists are not covered). To participate, a dental practice or facility must certify to the DEP that it:

- Has installed an amalgam separator system that serves every dental chair in the practice or facility where waste amalgam is generated. The system must be one that has been demonstrated to remove at least 95 percent of the amalgam waste containing mercury (using the ISO 11143 protocol);
- Maintains and operates the amalgam separator system according to its manufacturer's specifications;
- Uses only pH neutral cleaners to clean vacuum system lines;
- Recycles all amalgam waste containing mercury; and
- Will keep records to document that the program requirements are being met.

New Hampshire

New Hampshire has approximately 900 licensed dentists, 650 of which are actively practicing out of 450 offices. Based on a 2001 survey of 395 dentists, NH DES calculates that of the 650 practicing dentists:

- 62 percent or about 400 are presently using mercury amalgam
- 13 percent or about 85 are only using mercury amalgam
- 10 percent or about 65 have completely eliminated mercury amalgam and are using composites and other alternatives.

NH DES' P2 Program has been working with the NH Dental Society for the past two years to promote mercury reduction and increase environmentally responsible behavior among dentists. This effort has included speaking at workshops and developing and distributing a Best Management Practices Manual to all dentists.

In 2002, NH 1251, "An Act Relative to the Use of Mercury Amalgam Fillings by Dentists" became effective. HB 1251 requires the NH DES to adopt requirements relative to the use of environmentally appropriate disposal equipment for amalgam to trap and dispose of mercury. To fulfill the requirements of HB 1251, NH DES established a stakeholder workgroup (including the dental industry, environmental community, and state government) in late 2002 and drafted a set of rules. The rules

require dentists to install an ISO certified amalgam separator with 99 percent removal efficiency within 6 months of adoption of the rules. Dentists that have already installed ISO certified separators (that have at least a 95 percent efficiency) prior to the adoption of the rules will be “grandfathered.” In addition, dentists must properly maintain separator units and certify to the Department in writing that they have installed the required equipment. The rules are currently under review by the NH DES legal office and as soon as they are finalized the Department will enter into the formal rulemaking process.

Rhode Island – Best Management Practices

The Rhode Island Narragansett Bay Commission (NBC) Pretreatment and Pollution Prevention Sections teamed up to find a proactive solution to the mercury problem before EPA promulgates new regulations to control mercury discharges. To control the discharge of mercury amalgam from dental offices, the NBC Source Reduction and Control Team developed a Best Management Practices (BMP) document to educate dentists. Part of the BMP program requires the dentists to install Amalgam Separators on chair-side sinks and vacuum pumps to remove amalgam-containing mercury at the source before it enters the sewers. Amalgam separators must remove 98 percent mercury based upon ISO 11143 standards. The NBC source reduction team sponsored an educational workshop for the dentists in late 2002 and the Dental BMP can be found at www.narrabay.com.

The Rhode Island Dental Association (RIDA) has also taken a proactive stance with regard to controlling mercury discharges. RIDA had developed its own Mercury Amalgam BMP and they have contracted with an amalgam separator company to provide separators to its members.

The NBC treats sewage from ten cities and towns in the state of Rhode Island, serving approximately 40 percent of the states population. It is expected that the smaller POTWs in the state will adopt a Dental BMP Program similar to that of the NBC.

Vermont – Amalgam Separator Pilot Program

Dental offices are encouraged to submit self-certification reports regarding implementation of Best Management Practices (BMPs) related to mercury and other dental wastes. Self-certification is voluntary, but submittal of self-certification is an assurance that they are considered by VT DEC to be in compliance with hazardous waste and wastewater management regulations.

In 2003 VT DEC initiated an amalgam separator pilot project in. Amalgam separators From several different vendors were installed in dental offices (at no expense to the dental offices) and operational information on these units was collected. The pilot demonstrated that there are several commercially available amalgam separators that can reliably perform with minimal maintenance. In general, these separators did not interfere with vacuum or suction when properly installed, maintained, and operated. The report

Vermont Dental Amalgam Separator Project

(<http://www.anr.state.vt.us/dec/ead/mercury/PDF/AmalgamSeparatorReport.pdf>)

includes a list of considerations and recommendations on choosing an amalgam separator, product specifications, descriptions of the amalgam separators in the pilot, and unit cost information.

Eastern Canadian Provinces

Canada-Wide Standards (CWS)

Commitments made in the Memorandum of Understanding between Environment Canada and the Canadian Dental Association in support of the CWS are being implemented. The CWS for the dental sector is the application of best management practices to achieve a 95% reduction in mercury releases from dental amalgam waste discharges by 2005. These include an assessment of the number of Canadian dentists targeted by the CWS and the quantities of amalgam waste generated and collected annually, support for the development and validation of a technology verification protocol for amalgam separators, and the collection of information on waste management firms, amalgam separators and manufactures. Further work will include workshops for Canadian dentists on "Best Management Practices."

New Brunswick

A Letter of Understanding between the New Brunswick Department of the Environment and Local Government and the New Brunswick Dental Society is in effect to promote better management of dental amalgam waste and to meet the CWS goals.

Newfoundland and Labrador

The province is currently working with the Newfoundland and Labrador Dental Association to implement the Canada-wide Standard (CWS) on Mercury for Dental Amalgam Waste. Currently, all 168 licensed dentists in NL have been notified of the CWS but it is not known at this time how many have installed ISO11143 certified amalgam separators. Further meetings are planned to discuss the recently completed "Dental Amalgam Waste Management Pilot Project Phase 1 Report" conducted by Environment Canada in conjunction with Prince Edward Island Department of Fisheries, Aquaculture and Environment.

Nova Scotia

The Nova Scotia Dental Association (NSDA) has conducted a survey of their members on actions to reduce mercury emissions. The NSDA has 474 dentists operating in approximately 300 practices. As of 2003, an estimated 25 percent of practices have installed dental amalgam separators. The NSDA has an MOU with NSDEL and is working towards meeting the goal of the Canada-wide Standard to achieve a 95 percent reduction in mercury releases from dental amalgam waste discharges to the environment

by 2005, from a base year of 2000. The NSDA is continuing to educate their members on proper amalgam management.

Prince Edward Island (PEI)

The Province of P.E.I., Department of Fisheries, Aquaculture and Environment (FAE) and Environment Canada have completed Phase I of a dental amalgam waste management pilot project. The object of this project was to investigate the feasibility of installing ISO approved dental amalgam traps, or equivalent, in all dental offices on P.E.I., monitoring the performance of some of these units, and in conjunction with Environment Canada, developing a sludge sampling/mercury analysis program. Presently 100% of municipal sludge in the province is land-spread; by 2007, municipal sludge will be required to meet the U.S. EPA's Class B for bio-solids prior to being land-spread. The completed Phase I report has been passed on to the PEI Dental Association and the Department is awaiting their comments.

The Canada-wide Standard for Dental Amalgam Waste, endorsed in September of 2001, is the application of best management practices to achieve a 95 percent national reduction in mercury releases from dental amalgam waste discharges to the environment by 2005, from a base year of 2000. The PEI Department of Fisheries, Aquaculture and Environment will be working with the PEI Dental Association to achieve the objective of this standard; the province has 64 licensed dentists and 36 dental clinics that perform amalgam restoration work.

Quebec

The City of Montreal has implemented a by-law requiring the use of amalgam separators capable of achieving 95 percent efficiency in every dental office on its territory. The compliance date for this by-law was July 1, 2002, so that year one of implementation is just about to be over. Virtually 100 percent of dental offices have complied with the bylaw and are now operating with an amalgam separator. The City of Montreal is keeping updates on the situation to insure that these separators are used within normal efficiency parameters and that their maintenance is adequate. The City is also keeping a constant attention on the effluents and sewage sludge quality and is monitoring the changes in the mercury occurrence, before incineration. Incinerators ash is also monitored yearly for mercury content.

ATTACHMENT F

School Cleanout Update

The following, based on data collected by the NEG-ECP Mercury Task Force, provides a summary of jurisdictional efforts on schools as of the spring 2003. An updated status report will be completed in 2005.

New England Jurisdictions

Connecticut

Conducted 37 high school and junior high school cleanouts in summer and fall of 2002. Over 230 pounds of elemental mercury and mercury compounds as well as 1 gallon of liquid mercury compounds, 1400 lab thermometers and various other mercury instruments were collected.

Maine

In 2002 the Maine DEP successfully initiated a school education and outreach program focusing on mercury and other hazardous waste issues. Schools were invited to attend a day-long training on chemical management and sign up to have the mercury cleaned out of their schools. Eighty-four school personnel attended the workshops. Ultimately twenty-four schools and school districts signed up for the mercury/chemical clean-out project. The clean-out began in May and was completed in September, 2002. A total of 297 pounds of mercury were collected, for an average of a little over twelve pounds per school. At the same time 1629 pounds of hazardous wastes were also removed from school science labs. This represents an average of 68 pounds of hazardous waste per school.

Because of the program's success in removing a substantial amount of mercury, the Department decided to continue and expand the removal program. As of June 2003 forty additional Maine schools and school districts have signed up for removal of mercury, other hazardous lab chemicals and universal wastes (mostly lamps and computers). Again, DEP held two chemical management workshops in May 2003 to prepare schools for the program. DEP also developed a chemical inventory Excel program to aid schools in assessing their chemical stocks, including mercury. The Excel inventory program has been posted on the DEP web site so that it is accessible to any school.

The mercury pick-up will continue through September, as pick-ups can be coordinated with school personnel. A final tally of materials collected should be available by October 2003, at which point a final report will be completed.

Massachusetts

Massachusetts has continued its efforts to eliminate mercury in schools. By the end of this year mercury cleanouts will have been completed at over 130 schools in the state.

These cleanouts have been conducted through a DEP pilot project with NEWMOA; DEP municipal assistance grants to regional recycling organizations; and programs funded by municipal waste combustors as part of mercury source separation plans required under state regulations. Well over 1,000 pounds of mercury have been collected through these programs, including thousands of mercury-added products and many jars and flasks of elemental mercury. MA environmental and public health agencies also developed and conducted outreach and education efforts to school administrators and other municipal personnel, teachers and parents about mercury.

New Hampshire

New Hampshire has approximately 250 middle and high schools. Since the adoption of the NEG-ECP Mercury Action Plan, approximately 30 schools have performed partial or full clean-outs.

Effective January, 2001 NH banned the use of mercury, mercury compounds and mercury-added equipment (unless no suitable substitutes exist). Since the ban was enacted, NHDES' P2 Program has been conducting outreach and training to schools on the removal of mercury and other toxic chemicals, and provided some limited funding (approximately \$15,000) for removal. The project has also included working with schools to put in place written purchasing policies that discourage the purchase of unnecessary and toxic chemicals. Over 60 pounds of bulk mercury and mercury compounds have been removed from NH schools since January 2002. Other mercury-added devices such as thermometers and blood pressure cuffs have also been removed and recycled. In January 2003 the P2 program produced and distributed a document "Guidance for Eliminating Mercury in New Hampshire Schools" to all 140 NH high schools. The guidance document is available at:

http://www.des.state.nh.us/nhppp/hg_schools_guidance.htm

In addition, the P2 program has created a webpage for schools which focuses on proper management of chemicals, including mercury. The web page has been averaging approximately 180 hits per quarter.

In April 2004 the NHDES will undertake a project in the Connecticut River Valley (funds provided under the re-licensing agreement for the 15 Mile Falls Dam) which will provide mercury clean-out and disposal services to all 100 + middle and high schools in the watershed, over a two year period. This project will contribute significantly to the states goal of removing mercury from all secondary schools.

Rhode Island

There was limited activity on school clean-outs in RI in 2003, as the state continued to focus on implementation aspects of its mercury products legislation. The Department continues to address this issue as needed.

Vermont

School clean-out project was completed in 2001, with most schools participating. The final project report is now available at www.mercvt.org.

Eastern Canadian Jurisdictions

New Brunswick

The clean-out of chemicals, including mercury, from schools in New Brunswick began twenty years ago with the Department of the Environment removing chemicals from schools upon request by the individual schools. The Department of the Environment stored the chemicals in a central area and arranged for pick-up by a hazardous waste service provider. Mercury and its compounds have been banned from schools in New Brunswick since 1991. Between 1991 and 1994, the Department of the Environment assisted the Department of Education in arranging for a province-wide collection of banned chemicals from schools. The clean-out of mercury from schools is considered completed in the Province of New Brunswick.

Newfoundland

Newfoundland is working with its Department of Education on revisions to the “Science Safety Resource Manual” to address mercury and mercury-containing compounds in its schools. The revisions will prohibit “all compounds of mercury” and restrict “elemental mercury” to schools that possess adequate safety equipment and storage facilities to permit their safe use. Furthermore, restricted chemicals are only to be stocked in minimum quantities. The “Science Safety Resource Manual” is an initiative under the Atlantic Provinces Education Foundation. In 2002, the province removed 35.9 kg of mercury from schools, as well as additional mercury-containing compounds.

Nova Scotia

The province is still working with our Department of Education to address this issue but did not initiate any new projects since the 2001-2002 status report.

Prince Edward Island

In December of 2002, the P.E.I. Department of Education conducted a clean out of 16 facilities on P.E.I. This included 1 Community College, 1 School Board Office, 4 Consolidated Schools (grades 1-8), 2 Elementary Schools, 6 Intermediate Schools and 2 High Schools. The total cost to remove the hazardous materials, including mercury, was \$7,740.00.

Québec

In 2003, the Québec ministry of Environment is undertaking a review of every program or intervention previously done in schools to remove “historical” mercury or to prevent

contamination of students and staff after incidents with mercury containing products. It seems most cases were treated on a “piece by piece” approach since no province-wide intervention was ever undertaken.

An incident occurred a few years ago, in the southwestern part of the province (Eastern Townships), where a certain number of students and staff were intoxicated by a small mercury spill, which marked the beginning of a series of inquiries about dangerous materials in schools, including mercury. Thus, after having to manage a number of additional incidents, many schools in the same area have performed educational workshops with teachers and laboratory staff to ensure the proper handling and disposal of mercury and mercury products. These sessions were organized by the regional public health directorate. A parallel survey of school equipment and a substances inventory showed that no significant amounts of metallic or amalgamated mercury were kept in schools of that regional jurisdiction of the public health authority.

In the course of the year, as part of a new action plan to be approved in order to achieve the GCNA/ECP mercury objectives, the Québec ministry of Environment will be evaluating the need and feasibility of expanding such a procedure to the entire province. A complete portrait should be ready by next year.

ATTACHMENT G

RESEARCH AND MONITORING

Regional efforts in this area have included support for technologies to control and monitor mercury releases including:

- 1) controls for dental sector discharges and continuous emission monitors for mercury emissions;
- 2) fish and wildlife tissue monitoring and analysis, including long-term trend monitoring in selected waterbodies in MA and other jurisdictions;
- 3) atmospheric deposition monitoring and modeling to evaluate program effectiveness, in particular monitoring of mercury deposition in a predicted high deposition zone in MA;
- 4) emissions monitoring and inventory development, including data acquisition on emissions from regional coal-fired utilities; and,
- 5) collaborative research and data sharing efforts through NESCAUM, NEWMOA, and the Northeastern Ecosystem Research Cooperative Mercury Group.

An updated status report will be completed in 2005.